

Introduction

The Central Connecticut Health District is pleased to provide you with this Public Swimming Pool Operation Manual. This manual is intended to provide you with basic operational information for your daily use.

Following the guidelines and requirements found in this manual should help to reduce injuries, illnesses and the spread of disease and allow you to provide a safe, sanitary swimming facility.

We encourage you to contact us with any suggested improvements.

Thank you.

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Section I:

The Importance of Proper Chemistry

Pool Water Sanitizing

What is a sanitizer? It is a chemical or device that kills or inactivates the microorganisms present in the pool or spa water. These microorganisms may be harmful to humans and come in the form of bacteria, fungi, and viruses' etc.

Chlorine is the most common sanitizer used today but there are several other types available on the market. They include bromine, iodine, ozone, and ultraviolet light.

Because chlorine is the most common and most widely accepted type of sanitizer, it is the one that we will focus on.

Examining the Causes of Chlorine Demand

Microorganisms are living creatures too small to be seen by the naked eye and are constantly introduced into the pool by rain, wind, and the human bather. These microorganisms are destroyed by chlorine, but if there is not enough free available chlorine in the water these “germs” may be transmitted to the bather.

Chlorine has a dual function in that it kills microorganisms and oxidizes or “burns up” organic contaminants introduced by the bather. These organic contaminants include body oils, perspiration, suntan lotion, and deodorant.

Organic contaminants and microorganisms both consume chlorine. This consumption is called **chlorine demand** and is defined as the amount of chlorine that will react with contaminants before any chlorine is left unreacted.

Chlorine consumption is caused by the reactions with bacteria, organics, the sunlight, and ammonia's introduced by bathers. On a bright sunny day the ultraviolet rays of the sun can destroy 90% of the active chlorine. That is why pool operators will find that the chlorine demand is much higher on very hot sunny days when there are a lot of bathers using the pool, than on cloudy days with few bathers.

Types of Chlorine Residuals

1. Free Chlorine (FC): is the main sanitizer which kills germs. FC has no detectable taste or smell and causes no irritation when the concentration is at the recommended levels 0.8-3.0 parts per million (ppm).
2. Combined Chlorine (CC): is a chloramine that is formed by a reaction of FC with ammonia waste from the bathers. CC causes the chlorine odor in heavily used pools. CC has little sanitizing capability.
3. Total Chlorine (TC): is the sum of FC and CC.

$$\mathbf{TC = FC + CC} \quad \mathbf{or} \quad \mathbf{CC = TC - FC}$$

There are no tests that directly determine the level of combined chlorine (CC). You must first determine the free chlorine level, then the total chlorine level and plug the numbers into the equation and do the math.

For example, FC = 2.0 ppm and TC = 2.5 ppm

$$CC = TC - FC$$

$$CC = 2.5 \text{ ppm} - 2.0 \text{ ppm}$$

$$CC = 0.5 \text{ ppm}$$

Once the free chlorine and total chlorine residual levels have been determined, you can determine the level of combined chlorine. It will be necessary to shock or super chlorinate the water if the combined chlorine is greater than 0.2 ppm.

Shocking or Super Chlorinating (Also called breakpoint chlorination)

This process involves increasing the level of free chlorine (FC) to between 5-15 ppm in a very short period of time. This high level of chlorine literally “scours” the pools oxidizable organic matter at a very quick rate while at the same time destroying all the combined chlorine. The results will be a clean, sparkling pool with no chlorine odor.

A pool should be shocked or superchlorinated:

1. When fecal contamination or vomit is found in the pool water.
2. When the combined chlorine (CC) level is found to be greater than 0.2ppm.
3. After heavy bather loads.
4. When visibility of the water is poor.
5. After a heavy rain or windstorm.

It is highly recommended that the pool be closed until the volume of the pool has been filtered at least once and the level of free chlorine has returned to within the recommended range of 0.8 to 3.0 ppm. Dusk is typically the best time to shock the pool because the destruction of chlorine by the ultraviolet rays of the sun is minimized and pool users are not inconvenienced.

CHARACTERISTICS OF CHLORINES

	Sodium Hypochlorite	Calcium Hypochlorite	Lithium Hypochlorite
% Available Chlorine	12-15%	65-70%	35%
pH effect	Raises (pH13.0)	Raises (pH 13.0)	Raises (pH 10.7)
Lost to sunlight	Yes	Yes	Yes
Physical appearance	Liquid	Granular & Tablets	Powder

How to increase the concentration of chlorine:

1. **Sodium Hypochlorite**: levels can be increased using a chlorinator or chemical feeder or by pouring directly into the pool for a quick release. Follow the manufacturer’s specifications.
2. **Calcium Hypochlorite**: This product can be dissolved and introduced into the pool as a liquid or it can be added in granular form. Follow the manufacturer’s specifications.
3. **Lithium Hypochlorite**: This product is fast dissolving and may be introduced as a liquid once it has dissolved in water or it may be broadcast evenly over the water surface. Follow the manufacturer’s specifications.

How to shock or superchlorinate:

1. Determine the number of gallons of pool water to be treated and the % of available chlorine in the product that will be used to superchlorinate the pool (see chart on previous page).
2. Calculate the amount of chlorine needed by referring to a standard chart (see Table I) or a chart provided by the chlorine manufacturer.

Pool Water Test Kit

All test kits must use the DPD reagents to measure chlorine and be accurate to within 0.1 ppm.

These chemicals should be replaced yearly to ensure accurate test results.

Chlorine Problems and Solutions

Acceptable Range: 0.8 – 3.0 ppm

The Connecticut Public Health Code requires a free available chlorine residual of at least 0.8 ppm. The pool operator must close the pool whenever the free chlorine residual drops below 0.8 ppm.

Problem when chlorine is too low:

1. Inadequate disinfection

Problem when chlorine is too high:

1. Uneconomical use of disinfectant
2. Possible irritation
3. Bleaching of bathing suit or hair

Chemicals that can be used to lower chlorine based on the pool water volume:

1. Sodium Thiosulfate
2. Sodium Sulfite

Chemicals that can be used to raise free available chlorine residual based on the pool water volume:

1. Chlorine

Table I
Amount of Chlorine Compound to Introduce 1 ppm Chlorine

% Available Chlorine	Volume of Water						
	400 gallons	1000 gallons	5000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
5%	1.02 fl oz	2.56 fl oz	12.8 fl oz	1.60 pts	1.60 qts	1.00 gal	2.00 gal
10%	0.51 fl oz	1.28 fl oz	6.40 fl oz	12.8 fl oz	1.60 pts	2.00 qts	1.00 gal
12%	0.43 fl oz	1.07 fl oz	5.33 fl oz	10.7 fl oz	1.33 pts	1.67 qts	3.33 qts
35%	.015 oz	0.38 oz	1.91 oz	3.82 oz	7.63 oz	1.19 lbs	2.38 lbs
60%	0.09 oz	0.22 oz	1.11 oz	2.23 oz	4.45 oz	11.1 oz	1.39 lbs
65%	0.08 oz	0.21 oz	1.03 oz	2.05 oz	4.11 oz	10.3 oz	1.28 lbs
75%	0.07 oz	0.20 oz	0.95 oz	1.77 oz	3.77 oz	9.5 oz	1.17 lbs
90%	0.06 oz	0.15 oz	0.74 oz	1.48 oz	2.97 oz	7.42 oz	14.8 oz
100%	0.05 oz	0.13 oz	0.67 oz	1.34 oz	2.67 oz	6.68 oz	13.4 oz

from Pool & Spa Water Chemistry, Taylor Technologies, Inc.

pH

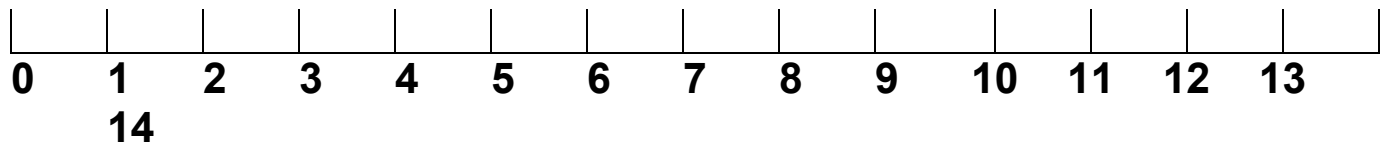
Acceptable Range: 7.2 – 7.8

pH is a measure of the degree of acidity or alkalinity of the pool water.

pH Scale

lemon juice

baking soda



ACIDIC

NEUTRAL

BASIC

Maintaining a pH between 7.2 - 7.6 assists in bather comfort as the human eye has a pH of 7.5.

Problems that arise when the pH is too low (less than 7.2):

1. Corrodes surface and equipment.
2. Etches plaster and concrete surfaces.
3. Causes excess use of sanitizer(chlorine, bromine, etc.).
4. Irritates bather's skin and eyes

Problems that arise when the pH is too high (greater than 7.8):

1. Scale deposits on surfaces and equipment.
2. Cloudy water
3. Poor sanitizer (chlorine, bromine, etc.) efficiency.
4. Eye irritation.

Chemicals used to lower the pH:

1. Muriatic Acid
2. Dry Acid

Chemicals used to raise the pH:

1. Soda Ash

Calcium Hardness

The term “water hardness” originated with the use of soap for laundering and cleaning. Certain ions in water combined with the chemicals in soap to form a solid precipitate, or scum, and make it hard to get soap to lather. Thus, water with more than 100 ppm of hardness is considered hard water; these hardness ions consist primarily of calcium and magnesium. Because calcium combines with carbonate to form calcium carbonate water, it is important that the calcium level be closely monitored to ensure balanced water.

Like pH and alkalinity, calcium hardness affects the tendency of water to be corrosive or scaling.

Recommended Range: 200 – 400ppm

Problems that arise when calcium hardness is too high:

1. Causes scale formation of surface, piping, and equipment.
2. Raises pH.
3. Clouds the water.
4. Decreases the flow rate.

Problems that arise when calcium hardness is too low:

1. Corrosion and staining of the pool wall will intensify.
2. Vinyl liners will crack.
3. Plaster may soften.
4. Tile grout will dissolve into the water causing tiles to pop off the side of the pool wall.
5. May lead to equipment corrosion.

Chemicals that can be used to raise calcium hardness based on the pool water volume:

1. Calcium Chloride

Table II
To Increase Calcium Hardness Using
Calcium Chloride

Volume of Water							
Desired Increase In ppm	400 gallons	1000 gallons	5000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	0.77 oz.	1.92 oz.	9.61 oz.	1.20 lbs	2.40 lbs	6.01 lbs	12.0 lbs
20 ppm	1.54 oz.	3.85 oz.	1.20 lbs	2.40 lbs	4.81 lbs	12.0 lbs	24.0 lbs
30 ppm	2.31 oz.	5.77 oz.	1.80 lbs	3.61 lbs	7.21 lbs	18.0 lbs	36.1 lbs
40 ppm	3.08 oz.	7.69 oz.	2.40 lbs	4.81 lbs	9.61 lbs	24.0 lbs	48.1 lbs
50 ppm	3.85 oz.	9.61 oz.	3.00 lbs	6.01 lbs	12.0 lbs	30.0 lbs	60.1 lbs
60 ppm	4.62 oz.	11.5 oz.	3.61 lbs	7.21 lbs	14.4 lbs	36.1 lbs	72.1 lbs
70 ppm	5.38 oz.	13.5 oz.	4.21 lbs	8.41 lbs	16.8 lbs	42.1 lbs	84.1 lbs
80 ppm	6.15 oz.	15.4 oz.	4.81 lbs	9.61 lbs	19.2 lbs	48.1 lbs	96.2 lbs
90 ppm	6.92 oz.	1.08 lbs.	5.42 lbs	10.8 lbs	21.6 lbs	54.1 lbs	108 lbs
100 ppm	7.69 oz.	1.20 lbs.	6.01 lbs	12.0 lbs	24.0 lbs	60.1 lbs	120 lbs

from Pool & Spa Water Chemistry, Taylor Technologies, Inc.

Total Alkalinity

Total alkalinity is the measure of the ability of water to resist changes in pH; it is also the measure of the dissolved minerals in water.

The purpose of alkalinity is to “*buffer*” the pool water to prevent wild swings in pH. A buffer is a chemical that resists change upon the addition of acids or bases. The ability to resist change is due primarily to the presence of a family of carbonate ions and these ions have a special role in the **balancing** of the water.

Total alkalinity and pH are related in water balancing because at low pH conditions (acidic water) the carbonate ions are converted to bicarbonates and the water becomes aggressive because there is no calcium carbonate formed. At high pH conditions (basic), too much of the carbonate is formed, and even the smallest amount of calcium ion present precipitates, causing scaling and or cloudy water. Monitor pH closely when adjusting total alkalinity.

Recommended Range: 80 – 120 ppm

Problems that arise when alkalinity is too low:

1. Difficulty to maintain the pH level.
2. Corrosion tendencies to pipes and side of the pool walls.

Problems that arise when alkalinity is too high:

1. Difficulty adjusting the pH level.
2. Water becomes cloudy.
3. Potential for pool sides to scale.

Chemicals that can be used to raise total alkalinity based on pool water volume:

1. Sodium Bicarbonate, 100% (Baking soda)

Chemicals that can be used to lower total alkalinity based on pool water volume:

1. Sodium Bisulfate
2. Muriatic Acid

Table III
To Increase Alkalinity Using Baking Soda
Sodium Bicarbonate, 100%

Desired Increase In ppm	Volume of Water						
	400 gallons	1000 gallons	5000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	0.90 oz	2.24 oz	11.2 oz	1.40 lbs	2.80 lbs	7.00 lbs	14.0 lbs
20 ppm	1.79 oz	4.48 oz	1.40 lbs	2.80 lbs	5.60 lbs	14.0 lbs	28.0 lbs
30 ppm	2.69 oz	6.72 oz	2.10 lbs	4.20 lbs	8.41 lbs	21.0 lbs	42.0 lbs
40 ppm	3.59 oz	8.97 oz	2.80 lbs	5.60 lbs	11.2 lbs	28.0 lbs	56.0 lbs
50 ppm	4.48 oz	11.2 oz	3.50 lbs	7.00 lbs	14.0 lbs	35.0 lbs	70.0 lbs
60 ppm	5.38 oz	13.4 oz	4.20 lbs	8.41 lbs	16.8 lbs	42.0 lbs	84.1 lbs
70 ppm	6.28 oz	15.7 oz	4.90 lbs	9.81 lbs	19.6 lbs	49.0 lbs	98.1 lbs
80 ppm	7.17 oz	1.12 lbs	5.60 lbs	11.2 lbs	22.4 lbs	56.0 lbs	112 lbs
90 ppm	8.07 oz	1.26 lbs	6.30 lbs	12.6 lbs	25.2 lbs	63.0 lbs	126 lbs
100 ppm	8.97 oz	1.40 lbs	7.00 lbs	14.0 lbs	28.0 lbs	70.0 lbs	140 lbs

from Pool & Spa Water Chemistry, Taylor Technologies, Inc.

Table IV
To Decrease Alkalinity Using Dry Acid
Sodium Bisulfate, 93.2%

Desired Increase In ppm	Volume of Water						
	400 gallons	1000 gallons	5000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	1.37 oz	3.44 oz	1.07 lbs	2.15 lbs	4.30 lbs	10.7 lbs	21.5 lbs
20 ppm	2.75 oz	6.87 oz	2.15 lbs	4.30 lbs	8.59 lbs	21.5 lbs	43.0 lbs
30 ppm	4.12 oz	10.3 oz	3.22 lbs	6.45 lbs	12.9 lbs	32.2 lbs	64.5 lbs
40 ppm	5.50 oz	13.7 oz	4.30 lbs	8.59 lbs	17.2 lbs	43.0 lbs	85.9 lbs
50 ppm	6.87 oz	1.07 lbs	5.37 lbs	10.7 lbs	21.5 lbs	53.7 lbs	107 lbs
60 ppm	8.25 oz	1.29 lbs	6.45 lbs	12.9 lbs	25.8 lbs	64.5 lbs	129 lbs
70 ppm	9.62 oz	1.50 lbs	7.52 lbs	15.0 lbs	30.1 lbs	75.2 lbs	150 lbs
80 ppm	11.0 oz	1.72 lbs	8.59 lbs	17.2 lbs	34.4 lbs	85.9 lbs	172 lbs
90 ppm	12.4 oz	1.93 lbs	9.76 lbs	19.3 lbs	38.7 lbs	96.7 lbs	193 lbs
100 ppm	13.7 oz	2.15 lbs	10.7 lbs	21.5 lbs	43.0 lbs	107 lbs	215 lbs

from Pool & Spa Water Chemistry, Taylor Technologies, Inc.

Table V
To Decrease Alkalinity Using
Muriatic Acid

Volume of Water							
Desired Increase In ppm	400 gallons	1000 gallons	5000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10ppm	1.02 fl oz	2.56 fl oz	12.8 fl oz	1.60 pts	1.60 gal	3.99 gal	2.00 gal
20ppm	2.04 fl oz	5.11 fl oz	1.60 pts	1.60 qts	3.20 gal	2.00 gal	3.99 gal
30ppm	3.07 fl oz	7.67 fl oz	1.20 qts	2.40 qts	1.20 gal	3.00 gal	5.99 gal
40ppm	4.09 fl oz	10.2 fl oz	1.60 qts	3.20 qts	1.60 gal	3.99 gal	7.99 gal
50ppm	5.11 fl oz	12.8 fl oz	2.00 qts	3.99 qts	2.00 gal	4.99 gal	9.98 gal
60ppm	6.13 fl oz	15.3 fl oz	2.40 qts	1.20 ga	2.40 gal	5.99 gal	12.0 gal
70ppm	7.16 fl oz	1.12 pts	2.80 qts	1.40 gal	2.80 gal	6.99 gal	14.0 gal
80ppm	8.18 fl oz	1.28 pts	3.20 qts	1.60 gal	3.20 gal	7.99 gal	16.0 gal
90ppm	9.20 fl oz	1.44 pts	3.59 qts	1.80 gal	3.59 gal	8.99 gal	18.0 gal
100ppm	10.2 fl oz	1.60 pts	3.99 qts	2.00 gal	3.99 gal	9.98 gal	20.0 gal

from Pool & Spa Water Chemistry, Taylor Technologies, Inc.

Importance of Balancing Pool Water

WATER BALANCE = CHEMICAL EQUILIBRIUM = MINERAL SATURATION

When water is balanced the owner/operator:

1. Avoids unnecessary and costly repairs
2. Avoids problems that may arise due to corrosion or scaling of the pool surface and equipment.
3. Saves money on costly chemicals needed to keep pH, calcium hardness, and total alkalinity within the recommended ranges.

It is the nature of water to dissolve things it comes in contact with until it becomes saturated. It is also possible for it to dissolve too much of whatever it is in contact with (the walls or grout of the pool) and become oversaturated.

Water can become aggressive (a low pH) and destroy pool walls and pipes with corrosion or it can become scaling (a high pH) and damage pipes and walls with mineral deposits.

To balance pool water it is necessary to understand:

	<u>Recommended range</u>
• pH	7.2 to 7.8
• calcium hardness	200- 400 ppm
• total alkalinity	80 - 120 ppm

How to Balance Your Pool Water

To determine if your pool water is balanced you must first measure pH, temperature, calcium hardness and alkalinity.

There are two basic methods you can use to determine if your pool water is balanced:

Method 1. Use a device such as the *Watergram* by Taylor Technologies which takes into account the pH, alkalinity, calcium hardness and temperature and allows you to then determine if the pool water is balanced.

Method 2. Use the *Langelier(or saturation) Index*, (see below and following page) to determine if the water is balanced after you test for pH, alkalinity, calcium hardness and temperature.

The Saturation Index requires the following equation to be completed:

$$\text{Saturation Index} = \text{pH} + \text{TF} + \text{CF} + \text{AF} - 12.1$$

The following factors are obtained from the Saturation Index chart below:

pH = is the direct pH level resulting after the water test

TF = is the temperature factor and is taken directly from the chart

CF = is the calcium hardness factor and is taken directly from the chart

AF = is the alkalinity factor, and is also taken directly from the chart

SATURATION INDEX CHART

TEMP ° F	TF Factor	CALCIUM HARDNESS EXPRESSED AS PPM CaCO ₃	CF Factor	TOTAL ALKALINITY EXPRESSED AS PPM CaCO ₃	AF Factor
32	0.0	5	0.3	5	0.7
37	0.1	25	1.0	25	1.4
46	0.2	50	1.3	50	1.7
53	0.3	75	1.5	75	1.9
60	0.4	100	1.6	100	2.0
66	0.5	150	1.8	150	2.2
76	0.6	200	1.9	200	2.3
84	0.7	300	2.1	300	2.5
94	0.8	400	2.2	400	2.6
105	0.9	800	2.5	800	2.9
128	1.0	1000	2.6	1000	3.0

A Saturation Index between – 0.5 and + 0.5 is balanced water

A Saturation Index over + 0.5 is scale forming

A Saturation Index below – 0.5 is corrosive or aggressive water

Examples of Pool Water Balancing Using the Langelier Index

Example #1 (Balanced)

<u>Test</u>	<u>Readings</u>	<u>Factors from the Chart</u>
pH	7.5	pH =7.5
water temp.	85°F	TF=0.7
Calcium hardness	300	CF=2.1
Alkalinity	100	AF=2.0

$$\text{Saturation Index} = \text{pH} + \text{TF} + \text{CF} + \text{AF} - 12.1$$

$$\text{Saturation Index} = 7.5 + 0.7 + 2.1 + 2.0 - 12.1$$

$$\text{Saturation Index} = +0.2, \quad \text{this water is balanced.}$$

Example #2 (Scale Forming)

<u>Test</u>	<u>Readings</u>	<u>Factors from the Chart</u>
pH	7.6	pH =7.6
water temp.	85 °F	TF=0.7
Calcium hardness	400	CF=2.2
Alkalinity	150	AF=2.2

$$\text{Saturation Index} = \text{pH} + \text{TF} + \text{CF} + \text{AF} - 12.1$$

$$\text{Saturation index} = 7.6 + 0.7 + 2.2 + 2.2 - 12.1$$

$$\text{Saturation Index} = +0.6, \quad \text{this water is scale forming and the operator should lower the calcium hardness and total alkalinity.}$$

Example #3 (Aggressive)

<u>Test</u>	<u>Readings</u>	<u>Factors from the Chart</u>
pH	7.2	pH =7.2
water temp.	85 °F	TF=0.7
Calcium hardness	125	CF=1.7
Alkalinity	75	AF=1.9

$$\text{Saturation Index} = \text{pH} + \text{TF} + \text{CF} + \text{AF} - 12.1$$

$$\text{Saturation index} = 7.2 + 0.7 + 1.7 + 1.9 - 12.1$$

$$\text{Saturation Index} = -0.6, \quad \text{this water is aggressive and the operator should raise the calcium hardness and total alkalinity.}$$

Recommendations For Chemical Adjustments

Best results are obtained when adjustments are continuously monitored over a 24-hour period and an automated chemical injection system is used.

Basic Rules of Adding Chemicals

Add large amounts gradually, in thirds, over a 2-hour period.

Add directly into the pool and spa when no swimmers are present and time is sufficient to allow even distribution of chemicals.

Add chemicals through feeders downstream of pump and filters, especially diatomaceous filters.

Add chemicals evenly by walking the perimeter of the pool.

Add chemicals in sequence to adjust for:

1. Free Available Chlorine
2. Total alkalinity
3. pH
4. Calcium Hardness

Transporting, Storing and Using Chemicals

Transporting Chemicals:

1. Keep your vehicle clean and organized.
2. Separate incompatible chemicals, distribute between front seat, back seat and/or trunk.
3. Don't purchase or carry damaged containers.
4. Anchor your load securely, so that it won't move around.
5. Ask your pool supply dealer for MSDS sheets, for your information and HAZMAT personnel in case of an accident.

Storing Pool Chemicals:

1. Store chemicals in a cool, dry, well ventilated area, with a locked entry. Do not set outside in the sun.
2. Keep out of reach of children (duh!).
3. Keep pool and spa chemicals separate from each other, and from other chemicals. Violent reactions such as explosion, fire or noxious gas production can occur when incompatible chemicals contact each other. Never, ever mix any chemicals together.
4. Do not stack chemical containers on top of one another.
5. Replace lids and caps firmly and immediately after opening.
6. Post MSDS sheets and emergency information and phone numbers nearby.

Using Pool Chemicals:

1. Follow label directions carefully. Read the instructions! If the label is faded or torn, don't guess what it is. Return it to your dealer.
2. Add chemicals to pool water, not the other way around. Chemicals should be added directly to the pool, or through a feeder especially designed for that type of chemical. Chemicals added directly to the skimmer could allow strong concentrations to harm pool equipment or swimmers. If the instructions suggest diluting with water first, use a clean, oversized bucket with water in it, then add chemicals to the water in the bucket. Read the Instructions!
3. Wear safety gear when handling chemicals. This may include a breathing respirator to prevent inhalation of fumes, face shield, gloves and apron.
4. Do not mix chemicals...EVER! This includes direct mixing of full strength chemicals in a bucket, diluted concentrations and even adding chemicals to the same location in the pool. At the very least you may get a water quality problem, or you may endanger your life or the life of others. Chemicals can mix with each other by using containers or

scoops which were previously used for other chemicals. Always use a clean bucket and scoop, designated only for that chemical.

5. Dispose of wastes and spills safely and properly. Immediately clean up any chemical spills. If a violent reaction has occurred, contact the fire department immediately and they will instruct you on steps to take until their arrival, if any. If the spilled chemical is a solid, carefully sweep it up using a clean broom and shovel, and place it in a clean, dry, plastic container. Avoid breathing the dust. If possible, dilute the chemical in water and add it to the pool or spa. Then test and balance the water. If this is not possible, contact the fire department for instructions on disposal. Do not place floor sweepings of chemicals back into the original container. Any foreign substance such as dust, dirt or water can cause a reaction inside the container. Do not use a vacuum cleaner or shop vac to clean up spilled substances. If the spilled substance is a liquid, it should be soaked up with clean, absorbent materials and placed inside a clean plastic or plastic lined container. Flush the area with large amounts of water.
6. Never smoke around any chemicals. Fire or explosion could result.
7. Do not breathe chemical fumes or dust. Wash skin if contact occurs. If chemicals splash in eyes, flush eyes for 15 minutes, and see a physician immediately.
8. Use ONLY a water filled fire extinguisher on a chlorine chemical fire. Never use the dry chemical type of extinguisher.
9. Keep posted emergency numbers for the fire department, poison control center, and MSDS sheets of all chemicals on hand.

Section II:

**Safety and
Pool Closure**

Required Signs

The Connecticut Public Health Code requires the following six signs be posted as noted at all public pools and spas.

1. Public Dressing Room/Pool Sign (example included)
2. “Warning: No lifeguard on Duty” sign when applicable
3. Telephone sign
4. Entrance Signs
5. Precautions for spa use (example included)
6. “NO DIVING” sign

1. Public Dressing Room/Pool Sign. Sign stating the following must be conspicuously posted at the pool and in the public dressing rooms.

- All persons shall bath with warm water and soap before entering the swimming pool.
- Any person known or suspected of having a communicable disease shall not use the pool.
- Spitting or blowing the nose in the pool is prohibited.
- Running, boisterous or rough play (except supervised water sports) is prohibited.

2. “Warning: No lifeguard on duty” Sign. When applicable, a sign stating “WARNING-NO LIFEGUARD ON DUTY” in legible letters at least four inches high must be posted and easily visible from all entry points into the pool area.

3. Telephone Sign. A sign with numbers at least one quarter inch high must be posted at the telephone stating “In case of emergency, dial 911”.

4. Entrance signs. 1) a sign must be posted at the entrance which includes directions to the nearest telephone, first aid unit and resuscitation equipment. 2) a sign with letters at least one quarter inch high which states “In case of emergency, dial 911” must be posted at the entrance.

5. Precautions for spa use. A sign must be posted in a clearly visible location adjacent to the spa stating the following:

Caution:

1. Elderly persons and those suffering from heart disease, diabetes, high or low blood pressure should not enter the spa.
2. Unsupervised use by children is prohibited
3. Do not use while under the influence of alcohol, anticoagulants, antihistamines, vasoconstrictors, vasodilators, stimulants, hypnotics, narcotics or tranquilizers.
4. Do not use alone.
5. Observe a reasonable time limit, (preferably not longer than 15 minutes) then shower, cool down and if you wish, return for another brief stay. Long exposures may result in nausea, dizziness or fainting.

6. “NO DIVING” sign. A sign stating “No Diving is permitted off the deck into shallow areas of the pool” shall be conspicuously posted at the pool. A sign stating “No Diving” or “No Diving off deck” is also permitted.

NOTICE

Public Dressing Rooms:

- . All persons shall bath with warm water and soap before entering the swimming pool.
- . Any person known or suspected of having a communicable disease shall not use the pool.
- . Spitting or blowing the nose in the pool is prohibited.
- . Running and boisterous or rough play (except supervised water sports) is prohibited.

Post in Public Dressing Room

Precautions for Spa Use

Caution:

1. Elderly persons and those suffering from heart disease, diabetes, high or low blood pressure should not enter the spa.
2. Unsupervised use by children is prohibited
3. Do not use while under the influence of alcohol, anticoagulants, antihistamines, vasoconstrictors, vasodilators, stimulants, hypnotics, narcotics or tranquilizers.
4. Do not use alone.
5. Observe a reasonable time limit, (preferably not longer than 15 minutes) then shower, cool down and if you wish, return for another brief stay. Long exposures may result in nausea, dizziness or fainting.

Post near spa

Required Safety Equipment

1. Required safety equipment

For every 100 feet of pool perimeter (or part thereof) you must have:

- A ring buoy with an inside diameter of less than 15 inches with fifty (50) feet of one quarter inch (1/4") line attached
- AND
- A life pole or shepherds crook with blunted ends a minimum of twelve (12) feet long

Mount the above lifesaving equipment in conspicuous places such as on lifeguard stands, fences or room walls of indoor pools. Life poles or shepherds crooks must be mounted in permanent sockets in the vicinity of the deep end of the pool.

EXAMPLE:

If your pool is rectangular in shape, measuring 25' x 50', with a total perimeter of 150', you will need two ring buoys and two life poles or shepherds crooks.

2. Depth Markers

Depth markers must be a minimum height of four inches (4") and placed on both the vertical sidewall of the pool and on the top of the pool deck or coping. Depth markings must exist at the minimum and maximum depths, where the pool floor changes slope and appropriate points in between.

Depth markers on Wading Pools—Wading pools shall be provided with a minimum of one depth marker on the pool rim on each side of the wading pool.

3. Recommended components of the First Aid Kit

- 1 box of assorted sized of adhesive strips (Band-aids)
- 1 box of sterile individually wrapped 3 inch gauze squares
- 1 box of sterile individually wrapped 4 inch gauze squares
- 2 rolls of 2 inch gauze roller bandages
- 1 bandage scissors
- 1 tweezers
- 2 instant cold packs
- 1 box of latex gloves
- 1 First Aid Manual
- 1 roll of adhesive tape (non-allergenic)
- 1 CPR mask
- 1 box of antiseptic wipes
- 1 oval eye pad

The location of the first aid kit and directions to the nearest phone must be posted at the entrance to the pool.

Modifications and equipment replacement

Unless the modification or replacement component (filter, chlorinator, pump, flow meter, etc.) is identical to that approved by the Connecticut Department of Public Health (CT DPH), plans or specification sheets must be submitted to the CT DPH for review and approval prior to installation. It is best to ensure that the equipment you are purchasing and installing meets the minimum requirements of the Connecticut Public Health Code. The CT DPH will review replacement components at no cost to the pool owner/operator.

Address and telephone number of the Connecticut Department of Public Health:

State of Connecticut
Department of Public Health
410 Capitol Avenue
MS# 51 REC
P.O. Box 340308
Hartford, CT 06134-0308

Phone: (860) 509-7297

Fax: (860) 509-7295

**STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
RECREATION PROGRAM**

**RECOMMENDED PROCEDURE FOR CLEAN-UP OF
FECAL, VOMIT AND BLOOD INCIDENTS IN AND AROUND
PUBLIC SWIMMING POOLS AND WHIRLPOOL SPAS**

Prevention Procedures:

1. Maintain all chemical feed systems and filtration equipment in good working order. Maintain the required minimum disinfection residual level at all times when the swimming pool and/or whirlpool spa are open for use.
2. All persons must be advised, through posting of signs, to bathe with warm water and soap before entering the swimming pool and/or whirlpool spa.
3. All persons with known or suspected of having a communicable disease must be advised, through posting of signs, not to use the swimming pool and/or whirlpool spa.
4. All persons wearing diapers should wear swimsuit diapers or tight fitting rubber or plastic pants.
5. Do not allow animals in the swimming pool.

Clean-Up Procedures:

Formed Fecal Incident in Swimming Pools and Whirlpool Spas:

1. Close the pool. Direct everyone to leave the pool. If there are multiple pools that use the same filter—all pools will have to be closed. Do not allow anyone to enter the contaminated pool(s) until all decontamination procedures are completed.
2. Remove as much of the fecal material as possible using a net or scoop and dispose of it in a manner in accordance with OSHA. Clean and disinfect the net or scoop (e.g., after cleaning, leave the net or scoop immersed in the pool during disinfection). Do not vacuum the fecal material from the pool.
3. Raise the free available chlorine level to 2 ppm (mg/l), while maintaining the pH between 7.2 - 7.5. Maintain these levels for at least 25 minutes before reopening the pool. Chlorine levels should be collected from various locations around the pool(s) to ensure that the entire pool is being treated. In the presence of chlorine stabilizers such as chlorinated isocyanurates, a level of 3.0 ppm (mg/l) of free available chlorine must be maintained.
4. Ensure that the filtration system is operating while the pool reaches and maintains the proper free available chlorine level during the disinfection process.
5. Establish a fecal accident log. Document each fecal accident by recording date and time of the event, note whether formed stool or diarrhea, and note the chlorine levels at the time of observation of the event. Before reopening the pool, record the chlorine level and pH, the procedures followed in response to the fecal accident (including the process used to increase chlorine levels if necessary), and the contact time.

Loose (Diarrhea) Fecal Incident in Swimming Pools and Whirlpool Spas:

1. Close the pool. Direct everyone to leave the pool. If there are multiple pools that use the same filter—all pools will have to be closed. Do not allow anyone to enter the contaminated pool(s) until all decontamination procedures are completed.
2. Remove as much of the fecal material as possible using a net or scoop and dispose of it in a manner in accordance with OSHA. Clean and disinfect the net or scoop (e.g., after cleaning, leave the net or scoop immersed in the pool during disinfection). Do not vacuum the fecal material from the pool.
3. Raise the free available chlorine concentration to 20 ppm(mg/l) and maintain the pH between 7.2 and 7.5 and maintain these levels for at least 12.75 hours. Chlorine levels should be collected from various locations around the pool(s) to ensure that the entire pool is being treated.
4. Ensure that the filtration system is operating while the pool reaches and maintains the proper free available chlorine level during disinfection.
5. Backwash all sand and DE filters thoroughly. Replace cartridges in cartridge filters.
6. Swimmers may be allowed back into the pool after 12.75 hours and when the free available chlorine level has been returned to the normal operating range.
7. Establish a fecal accident log. Document each fecal accident by recording date and time of the event, note whether formed stool or diarrhea, and note the chlorine levels at the time or observation of the event. Before reopening the pool, record the chlorine level and pH, the procedures followed in response to the fecal accident (including the process used to increase chlorine levels if necessary), and the contact time.

Vomit Incident in Swimming Pools and Whirlpool Spas:

1. Vomiting as a result of swallowing too much water is probably not infectious. No action is necessary.
2. Vomiting full contents of the stomach would require the same response as that of a formed fecal incident as outlined above.

Blood Incident in Swimming Pools and Whirlpool Spas:

There is no recommended procedure for clean-up or closing the pool after a blood spill in a swimming pool and/or whirlpool spa. However, as a matter of comfort for the patrons, the pool operator may opt to close the pool temporarily.

Dead Animals Found in the Swimming Pools and Whirlpool Spas:

1. It is the recommendation of this office that the animal should be removed, by a net or scoop, and disposed of properly.
2. The pool should be closed and the free available chlorine level should be increased to at least 10 ppm (mg/l), while maintaining a pH level between 7.2 - 7.5.
3. Swimmers may be allowed back into the pool when the free available chlorine level has been returned to the normal operating range.

Fecal, Vomit or Blood Incident on the Pool Deck Area:

1. Block off the area of the spill from patrons until clean-up and disinfection is complete.
2. Put on disposable latex gloves to prevent contamination of hands.
3. Wipe up the spill using paper towels or absorbent material and place in a plastic garbage bag.
4. Gently pour bleach solution (9 parts cool water and 1 part household bleach*) onto all contaminated areas of the deck.
5. Let the bleach solution remain on the contaminated area for 20 minutes.
6. Wipe up the remaining bleach solution.
7. All non-disposable cleaning materials used such as mops and scrub brushes should be disinfected by saturating with bleach solution and air dried.
8. Remove gloves and place in plastic garbage bag with all soiled cleaning materials.
9. Double-bag and securely tie-up plastic garbage bags and discard.
10. Thoroughly wash hands with soap and water.

* Add the household bleach to the water and gently mix the solution. Since a solution of bleach and water loses its strength quickly, it should be mixed fresh before each clean-up to make sure it is effective.

NOTIFY THE LOCAL HEALTH DEPARTMENT IN YOUR AREA OF ANY INCIDENTS THAT RESULT IN POOL CLOSING.

Revised 1/3/2008

Other times when the pool must be closed

- **When the clarity of the water is such that the bottom of the pool cannot be observed. (For example: The bottom drain grates cannot be observed or a 6” black disk on the bottom of the pool cannot be observed)**
- **When the free available chlorine residual is less than 0.8 ppm .**
- **Where severe structural deficiencies and disrepair present substantial and imminent safety hazards.**
- **When appropriate drain grates are not provided on the bottom drains or sidewall suction fittings are not capped.**

Section III:

CT Public Health Code Regulations

Swimming Pools and Bathing Places

19-13-B33b. Public pools

The following requirements shall apply to any public pool.

(a) Definitions.

- (1) "Public Pool" means an artificial basin constructed of concrete, steel, fiberglass or other relatively impervious material intended for recreational bathing, swimming, diving, or therapeutic purposes which is located either indoors or outdoors and is provided with a controlled water supply and which is not used or intended to be used as a pool at a single family residence. The term also includes a pool located at a single family residence which is used or intended to be used for commercial or business purposes. The term "public pool" includes any related equipment, structures, areas, and enclosures that are intended for the use of the pool patrons or pool staff such as toilet, dressing, locker, shower, and pool equipment rooms. Public pools shall be classified as follows:
 - (A) "Public Swimming Pools" are conventional pools used or intended to be used for recreational bathing, swimming and water recreation activities.
 - (B) "Public Wading Pools" are pools principally used or intended to be used for wading and recreational bathing by small children.
 - (C) "Public Spas," "Whirlpools," or "Hot Tubs" are pools used for recreational bathing which are used in conjunction with high velocity air systems, high velocity water recirculation systems, hot water, cold water, mineral baths or any combination of these items.
 - (D) "Public Diving Pools" are pools used only for diving or the training and practice of diving techniques.
 - (E) "Special Purpose Public Pools" are pools used exclusively for a particular purpose, including but not limited to water flumes, pools for scuba diving instruction, therapeutic pools, hydrotherapy pools, floatation vessels and pools used in aquatic programs for handicapped persons.
- (2) "Commissioner" means the commissioner of health services or his designee.
- (3) "Depth Markers" means numerals of four inches minimum height which are of a contrasting color with the background of the pool and denote water depth in the immediately adjacent portion of the pool.
- (4) "One Unit of Lifesaving Equipment" shall consist of a ring buoy not more than fifteen inches inside diameter to which shall be attached a fifty foot length of one-quarter inch line, and a life pole or shepard's crook with blunted ends which is a minimum of twelve feet in length.

(b) General requirements for public pools.

- (1) Construction. No person shall construct a public pool or shall substantially alter or reconstruct any public pool except after the plans for such have been approved in accordance with the specifications contained in the most recent edition of the Connecticut Public Swimming Pool Design Guide as adopted and amended by the commissioner. Such plans shall be prepared by and bear the seal of an engineer or architect licensed to practice in the State of Connecticut and shall be approved by the commissioner. The applicant shall forward copies of the approved plans to the director of health or his authorized agent. All public pools shall be constructed or substantially altered or reconstructed in accordance with the plans and specifications approved by the commissioner unless prior approval of changes has been granted in writing. The danger of disease, drowning or injury to bathers shall be reduced to a practical minimum. The commissioner may evaluate public pools constructed without the required plan approval to assess conformance with specifications of the Connecticut

Public Swimming Pool Design Guide. The commissioner may issue a "certificate of approval for use" to public pools on which construction was completed prior to January 1, 1980 and which are found to comply substantially with the aforementioned criteria. No such certificate shall be issued where deviations from design criteria may substantially increase the risk to public health and safety.

- (2) Supervisory Personnel. A person knowledgeable in the operation of the pool and in pool water chemistry and testing shall be on duty on the premises where the pool is located whenever the pool is open for use. Names of supervisory personnel shall be submitted to the local health department annually and whenever a change in such personnel occurs.
- (3) Pool Water Quality. Not more than Fifteen per cent of the samples of pool water covering a consecutive period of one month or more shall either (1) yield more than two hundred bacterial colonies per milliliter, as determined by the standard (35 degrees C) agar plate count, or (2) show positive test (confirmed test) for coliform organisms in any of five 10-mL portions inoculated into fermentation tubes or contain more than 1.0 coliform colonies per 50 mL. when the membrane filter test is used. All samples shall be collected, the residual disinfectant removed, and the examination conducted in accordance with the procedures outlined in the latest edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association, American Water Works Association, and Water Pollution Control Federation).
- (4) Pool Water Clarity. At all times when the pool is in use the water shall be sufficiently clear to permit a secchi disc or a black disc six inches in diameter on a white field, placed on the bottom of the pool at the deepest point, to be clearly visible from the pool deck.
- (5) Pool Water Disinfection and Test Kits. Pool water shall be disinfected by an automatic disinfectant feeder which imparts a measurable residual at all times when the pool is in use. These chemical feeders shall comply with the standards of the National Sanitation Foundation or other standards approved commissioner of health services. When chlorine is used, a free chlorine residual of at least 0.8 mg/l as measured by an approved method listed in "Standard Methods for the Examination of Water and Wastewater" as described in subsection 3 above shall be maintained throughout the pool whenever it is open or in use. If cyanuric acid is used to stabilize the free available residual chlorine, or if chlorinated isocyanurate compounds are used, the concentration of cyanuric acid in the water shall not exceed 100 mg/l and a free available chlorine residual of at least 1.5 mg/l shall be maintained throughout the pool whenever it is open or in use. If other halogens are used, residuals of equivalent disinfecting strength shall be maintained. Other disinfecting materials or methods may be used when they have been demonstrated to the commissioner to provide satisfactory disinfection. A test kit for measuring the concentration of the disinfectant, accurate within 0.1 mg/l shall be provided, at each pool. If the cyanuric acid or chlorinated isocyanurates are used, proper testing equipment for measuring cyanuric acid concentration shall be provided. Chemicals in test kits shall be replaced yearly unless shown to produce accurate test results.
- (6) Pool Water pH and Alkalinity. The pool water shall be maintained at a pH value of not less than 7.2 and not over 7.8. Testing equipment for measuring pH value shall be available at each pool. Caustic alkalinity shall not be present.
- (7) Records and Testing. A pool operation record including all test results shall be maintained on a daily basis by the pool operator. Immediately prior to the daily opening of the pool for use, tests shall be made to determine the amount of residual disinfectant and the pH. These tests shall be repeated at sufficient frequency during

periods of bather use to assure that an adequate disinfectant level and pH value are maintained. Whenever tests indicate that an inadequate disinfectant level or inappropriate pH value are present, immediate action shall be taken to reestablish an appropriate disinfectant level and pH value.

- (8) Decks, Dressing Rooms, Toilet Rooms, Shower Requirements. The dressing rooms, hallways, toilet rooms, shower rooms or other rooms to which patrons of pools have access shall be kept clean, in good repair, and well ventilated at all times. The floors of the pool deck and all shower rooms and locker rooms shall be treated with a 0.5% chlorine solution, or an equivalent fungicide, daily. Combs or brushes for common use shall not be provided. All persons shall bathe with warm water and soap before entering the pool. Warm water at a temperature of 90 degrees F to 105 degrees F, shall be furnished at showers convenient to the pool for this purpose. Adequate and convenient toilet facilities shall be available for the use of swimmers. Toilet, lavatory sink, and shower fixtures shall be maintained in proper repair so as to be available in ratios required by Design Criteria in effect at the time of plan approval.
- (9) Equipment Rooms, Equipment Areas, and Equipment. Equipment rooms, areas, and equipment shall be kept in good repair and in a clean and sanitary condition. Drain grates shall be vandal proof, designed to prevent hand entrapment, and shall be secured in place in a manner that will prevent removal by bathers.
- (10) Deck Equipment. Handrails shall be provided at all steps, stepholes, and ladders. When provided diving stands, lifeguard stands, handrails, and ladders shall be properly secured to the pool deck or pool, as appropriate. Deck accessories and equipment shall be properly maintained and stored.
- (11) Pool Chemical Storage. Pool chemicals shall be stored in cool, dry, clean, and well ventilated areas and so as to preclude accidental mixing of different chemicals. Containers shall be tightly closed when not in use.
- (12) Vacuuming. Pool bottoms shall be vacuumed or mechanically cleaned as frequently as required to maintain pool cleanliness.
- (13) Accessibility to Pool Area. All outdoor pools shall be surrounded by a barrier which shall be a minimum of four feet high and designed to discourage access by unauthorized persons. Entry gates shall be self closing and self latching. When the pool is not open for use, access to the pool shall be prevented.
- (14) Lifeguards. When no lifeguard service is in effect a warning sign shall be placed in plain view and shall state "Warning - No Lifeguard on Duty" with legible letters, at least four inches high. This warning shall be easily visible from all entry points into the pool area.
- (15) First Aid Kit. Every public pool shall be equipped with an American National Red Cross standard 24-unit first aid kit or equivalent. This first aid kit shall be kept filled and ready for use.
- (16) Emergency Telephone. There shall be a telephone or other suitable device for emergency communication readily available in the immediate vicinity of each pool. This telephone or device shall be on the premises where the pool is located.
- (17) Signs. Signs shall be conspicuously posted at the pool and in public dressing rooms stating the following:
 - (A) All persons shall bathe with warm water and soap before entering the pool.
 - (B) Any persons known or suspected of having a communicable disease shall not use the pool.
 - (C) Spitting or blowing the nose in the pool is prohibited.
 - (D) Running, boisterous or rough play (except supervised water sports) is prohibited.

- (18) Emergency Communications. Instructions regarding emergency calls shall be prominently posted. All pools shall have posted at their entrance (a) directions to the nearest telephone and the nearest first aid unit and resuscitation equipment; (B) the telephone numbers, in print at least one-quarter inches high, of the nearest police and fire departments, emergency medical service provider, hospital and physicians on call in the immediate area. Additionally these telephone numbers shall be posted at the nearest telephone.
- (19) Registration. No person, firm, or corporation shall operate or maintain, within any town, city or borough, any public pool without local permits or licenses if such permits or licenses are required by local ordinance. If such local permits or licenses are not required, the person, firm or corporation shall register the name of the owner or owner's agent, business address, and pool location with the local director of health of the town, city, borough, or district where the public pool is located.
- (c) Additional requirements for public swimming pools and public diving pools
- (1) Depth Markers. Depth markers shall be provided on the pool rim at points of minimum and maximum depths, at all points where the pool floor changes slope, and at appropriate points in between. Depth markers at these points shall be visible from within the pool and while standing on the pool deck.
 - (2) Lifeguard Stands. When a lifeguard is on duty, there shall be a raised stand 4 feet minimum height for the lifeguard, located at pool side adjacent to the deep end of the pool, so that all areas of the pool are visible to the lifeguard.
 - (3) Lifesaving Equipment. Each public Swimming pool and public diving pool shall be provided with one unit of lifesaving equipment for each one hundred feet of perimeter of the pool. Life poles or shepherd's crooks shall be mounted in permanent sockets toward the deep area of the pool. Lifesaving equipment shall be mounted in conspicuous places around the pool such as on lifeguard stands, fences or barriers of outdoor pools, and room walls of indoor pools.
 - (4) Sign. A sign stating the following shall be conspicuously posted at the pool: "No diving is permitted off the deck into shallow areas of the pool."
- (d) Additional requirements for public wading pools. Depth Markers. A minimum of one depth marker shall be provided on the pool rim on each side of public wading pools.
- (e) Additional requirements for public spas.
- (1) Pool Water Disinfection. When chlorine is used, a free available chlorine residual of at least 1.0 mg/l shall be maintained throughout the public spa whenever it is open or in use. If other halogens are used, residuals of equivalent disinfecting strength shall be maintained.
 - (2) Pool Water Temperature. Pool water temperature shall not exceed 104 degree F in public spas.
 - (3) Depth Markers. All public spas shall have a minimum of two depth markers indicating maximum water depth. These depth markers shall be located on the spa rim or deck immediately adjacent to the pool.
 - (4) Precaution Sign. A precaution sign is to be mounted in a clearly visible location, adjacent to the spa. This precaution sign shall contain the following warnings:
CAUTION
 - (A) Elderly persons and those suffering from heart disease, diabetes, high or low blood pressure should not enter the spa.
 - (B) Unsupervised use by children is prohibited.
 - (C) Do not use while under the influence of alcohol, anticoagulants, antihistamines, vasoconstrictors, vasodilators, stimulants, hypnotics, narcotics or tranquilizers.
 - (D) Do not use alone.

- (E) Observe a reasonable time limit, (preferably not longer than 15 minutes) then shower, cool down and, if you wish, return for another brief stay. Long exposures may result in nausea, dizziness or fainting.
- (5) Oils, Body Lotions and Soaps. Oils, body lotions and soaps shall be completely removed by the bather prior to use of public spas.
- (f) Special purpose public pools. Special purpose public pools shall meet all applicable requirements for public pools.
- (g) Responsibility of director of health. When any public pool is found not to meet the requirements of these regulations, or when a condition is found which constitutes a public health or safety hazard or a health nuisance to bathers or pool patrons, the director of health may order such public pool closed until corrections are made. The director of health shall order such closure when there is significant evidence of communicable disease being transmitted through use of the pool, when the public pool is being operated in such manner as to constitute a significant health nuisance, or when imminent safety hazards exist. Inspections shall be conducted by the director of health or his authorized agent to evaluate conformance with these regulations and to protect the public health and safety. Any person aggrieved by an order issued by a director of health, may within forty-eight hours after the making of such order, appeal to the commissioner of health services in accordance with Section 19a-229 of the General Statutes and Sections 19-2-1 to 19-2-43 inclusive of the Regulations of Connecticut State Agencies.
(Effective October 26, 1984.)

Section IV:

**Opening Day
Checklist**

Opening Day Checklist

1. All chemicals should be in their proper ranges, so that the water in the pool is balanced:
 - a) Total Alkalinity 80 – 120
 - b) Calcium Hardness 200 – 400
 - c) Free chlorine 0.8 ppm – 3.0 ppm
 - d) pH 7.2 – 7.8
2. All safety equipment must be out and in their designated locations:
 - a) Ring buoy with a 50' line
 - b) 12' mounted pole or shepherd's crook
 - c) Raised lifeguard stand (if a lifeguard is on duty)
 - d) First aid kit
3. The following six signs must be posted:
 - a) 911 sign posted above the phone
 - b) Directions to the nearest phone and first aid kit
 - c) "Warning – No Lifeguard on Duty" sign
 - d) Public dressing room sign
 - e) Entrance sign
 - f) "NO DIVING" sign
4. Provide a proper test kit.
5. Provide pool records.
6. The pool must be surrounded by a 4 foot high fence with a self-closing/self latching gate.
7. All gutters/skimers and weirs must be working and installed.
8. Provide liquid soap in the showers and at the hand washing sinks in the restrooms.
9. Single bottom main drains must be provided with an anti-vortex cover or replaced with two bottom main drains installed so that water flow cannot be diverted through only one of the two drains.

Central Connecticut Health District

SERVING THE TOWNS OF BERLIN, NEWINGTON, ROCKY HILL AND WETHERSFIELD

Swimming Pool Inspection Report

Name of Facility:				Date of Inspection:							
Address:				Town:							
Owner/Operator:				Phone:							
Type of pool:				Flow Meter Reading:							
Pool Capacity (Gals.):				Turn-over rate:							
Type of Filter:				Pool Drainage:							
Filter Backwash Disposal:				Disinfectant in Pool:							
Total Alkalinity (60 - 180):											
Calcium Hardness (200 - 400):				pH (7.2 - 7.8):							
Free Chlorine (0.8 ppm - 1.5 ppm)				Temperature of Water (78° - 82°):							
Total Chlorine				Combined Chlorine (< 0.2 ppm)							
			Satisfactory						Satisfactory		
			Yes	No	N/A				Yes	No	N/A
1. Appearance of Water						8. Daily Disinfection of walks, floors, and decks					
2. Depth Marking						9. Fencing:					
3. Safety Equipment						a. 4 feet high					
a. Raised lifeguard stands						b. self-closing/self latching					
b. Ring buoy with 50' line						10. Toilet/Shower facilities					
c. 12' mounted pole or shepherd's crook						11. "Warning--No Lifeguard on Duty" sign posted					
d. First aid kit						12. Cross connection					
4. Emergency phone						13. Gutters/skimmmers					
5. Test kit						14. Public Dressing Room signs					
6. Pool records (pH/chlorine)						15. Entrance Signs Posted					
7. Night lights						16. Other					

Remarks:

Inspected By: _____ Received By: _____

Daily and Weekly Responsibilities

1. Maintain a **daily** log of the chlorine and pH levels with readings taken at least three times per day.
2. Disinfect the decks, dressing rooms, and bathrooms on a **daily** basis.
3. Ensure safety equipment is provided on a **daily** basis.
4. Test alkalinity and calcium hardness on a **weekly** basis.

Public Swimming Pool Operation Manual

Prepared by the Central Connecticut Health District
Serving Berlin, Newington, Rocky Hill, and Wethersfield

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Newington Office
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Phone (860) 665-8586 Fax (860) 665-8533

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