



00





Hendricks County Health Department

#### Agenda

- 9:00 AM Sign-In & Welcome
- 9:15 AM Introduction to our program
- 9:30 AM Rules & Reasons for closure
- 10:00 AM Incident Reports & Operating Records
- 10:15 AM Break
- **10:30 AM Opening inspections (Safety & Health)**
- 10:45 AM When & How to add chemicals
- 11:00 AM Testing– Using a test kit
- 11:45 AM Questions & Answers
- 12:00 PM Adjourn, Thank you!

# **Inspections and Permits**

Public Health       Hendricks County Health Department         Swimming Pool Inspection Form       Inspection based on Indiana State Department of Health 410 IAC 6-2.1 and Hendricks County Public Pool and Spa Ordinance 2003-27         Watch Conf Minis Department       Permit Number:         Pool Name:       Permit Number:	
Size: under 2000 sq. ft 2000 sq. ft. and over Pool Type:	
Purpose: Routine Follow-up Opening Complaint #	
Pool Water Chemistry (Section 30)       Sat.       Unsat.       Lifesaying and Safety Equipment (Section 34)       Sat.       Unsat.       NA         Operating Records        Life Pole             Test Kit        Ring Buoy with Rope              Free Chlorine       ppm        Spine Board with Straps and Head Inumobilizer            Combined Chlorine       ppm        First Aid Kit with Two (2) Blankets            pH         Telephone              Calcium Hardness       ppm       Depth Markings               Qanuric Acid       ppm       Lifeguards (Section 35)       Sat.       Unsat.       NA          Disinfectant Type        Lifeguards (Section 35)       Sat.       Unsat.       NA         Chemical Storage (Section 33)       Sat.       Unsat.       Lifeguard Platform or Chair           Sanitary Facilities (Section 29)       Sat.       Unsat.       NA       Supplies and Water <th>With Seven and Seven and</th>	With Seven and
Bacteria Samples:/_ // / /_/ /_/	Hendricks County Public Pool and Spa Ordinance 2003-27.
(Section 31) S U S U S U S U S U S U	This permit is not transferable and may be suspended or revoked by the Health Officer.
Violation Narrative	Importantial Health Specialist     Date     Approved     David Stopperich, MD       Importantial Health Specialist     David Stopperich, MD     Headth Officer
Health Department :         Phone: (317) 745-9217           Copy of Report Received by:         Date:	

#### **Pool Rules**

**Public and Semi-Public Swimming Pools Rule** 

410 IAC 6-2.1



Indiana State Department of Health Environmental Public Health Division 2 N. Meridian St., 5-E Indianapolis, IN 46204

Revision Effective: August 26, 2010

#### 2018 Model Aquatic Health Code Code Language



#### **Construction Code**

#### ARTICLE 20. SWIMMING POOL CODE

Rule 1. Indiana Swimming Pool Code (Repealed)

(Repealed by Fire Prevention and Building Safety Commission: filed Aug 14, 1989, 9:00 a.m.: 13 IR 81)

#### Rule 1.1. General Provisions and Definitions

#### 675 IAC 20-1.1-1 Title and availability

Authority: IC 22-13-2-2 Affected: IC 22-12; IC 22-13; IC 22-15; IC 36-7

Sec. 1. (a) This article shall be known as the Indiana Swimming Pool, Spa and Water Attraction Code, third edition. Whenever the term "this code" is used in this article, it shall mean the Indiana Swimming Pool, Spa and Water Attraction Code, third edition.

(b) The Indiana Swimming Pool, Spa and Water Attnotion Code is available at the Department of Homeland Security, Code Services Section, Indiana Government Center South, 302 West Washingt on Streek, Room W246, Indianapoilo, Indiana 46204, Bire Prevention and Building Safety Commission; 6751AC20-11-1; filed Aug 14, 1989, 900 a.m.: 131R 38, eff Sep 1, 1989 [RC 4-22-2-36 suspends the effectiveness of a rule document for hirty (00) days after filesy with the secretary of rule. ISA Document #89-17 was filed Aug 14, 1989.]: readopted filed Goat 11, 2001, 2:49 p.m.: 25 B 530; readopted filed Sep 21, 2007, 9:20 a.m.: 20071001-Br-675070388RFA; readopted filed Oct 10, 2007, 9:16 a.m.: 20071081-Br-675070388RFA; readopted filed Aug 7, 2013, 8:51 a.m.: 20130904-J8-673310181FA)

#### 675 IAC 20-1.1-2 Definitions; general

Authority: IC 22-13-2-2 Affected: IC 22-12; IC 22-13; IC 22-15; IC 36-7

Sec. 2. For the purpose of this code, the de finitions in this sule apply throughout this article. (Pire Prevention and Building Safety Commission; 675 IAC 20-L1-2; filed Aug 14, 1989, 9:00 a.m.: 18, 8, 6f Sep 1, 1989 [IC 4-22-2:66 supends the effectiveness of a rule document for theirly (38 days after fileg with the scentary of state. ISA Document 399-17 was filed Aug 14, 1989.); readopted filed Sep 11, 2001, 2:49 p.m.: 25 IR 530; readopted filed Sep 21, 2007, 9:20 a.m.: 20071010-JR-675070B88RFA; readopted filed Aug 7, 2013, 8:51 a.m.: 2017001-BR-675070B88RFA; readopted filed Aug 7, 2013, 8:51 a.m.: 20130904-RR-675130B1RFA)

#### 675 IAC 20-1.1-3 Definitions "A" Authority: IC 22-13-2-2 Affected: IC 22-12: IC 22-13: IC 22-15: IC 36-7

Sec. 3. (a) "Abrasi on hazard" means a sharp or rough surface that could cause injury under normal use.

(b) "Accessible" means, when applied to a fixture, connection, appliance, or equipment, having access thereto, but may require the removal of an access panel, door, or similar distruction. "Readily accessible" means direct access without the necessity of removing any panel, door, or similar obstruction.

(c) "Agistica" means the mechanical or manual movement to dislodge the filter aid and dirt from the filter element. (d) "Airbreak" means a physical separation that may be a low inlet into the indirect waste receptor from the fixture, appliance, or device indirectly connected.

(e) "Air bump assist backwash" means, in a diatomite type filter, the compressing of a volume of air in the filter effuent chamber (by means of an air compressor or by the water pressure from the recirculating pump) that, when released, rapidly decompresses and forces water in the filter tank through the elements in a reverse direction dislodging the filter aid and accumulated dirt and carrying them to wate.

(f) "Airgap" means the undostructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture receptor, or other device and the food level rim of the receptacle. (g) "Air induction system" means a system whereas a volume of air (only) is induced into hollow ducts built into a spa floor, Any alterations, not like for like, to a pool must be submitted to the Indiana Department of Homeland Security, Division of Fire and Building Safety (Plan Review Branch) prior to construction.

#### **Construction Code**

#### **Department of Homeland Security**

#### Fire Prevention & Building Safety Commission

#### Inspections on Website



#### www.co.hendricks.in.us/health\_pool\_spa.html



#### **Inspection Frequency**

- All routine inspections are unannounced
- Indoor pools are inspected once a month
- Outdoor pools are inspected 2X per month when facilities are open
- Or as necessary if facility continues to have issues
- Follow-up inspections are done as needed and we like to stay on site if possible to reopen pools



# Hendricks County Statistics

- □ 127 Pools in Hendricks County
- 88 Pools, 30 Waders, 7 Spas, and 2 Therapy Pools
- 1168 Total inspections (divided among 8 inspectors and summer interns)
- Full time inspectors are Certified Pool Operators (CPO)
- 263 Total closures in 2018 (22.5%)



# Summary: Reasons for closure

- Disinfectant (Chlorine or Bromine)
- □ pH
- Water Clarity
- Bacteriological Samples
- □ Main Drains (not visible, any piece broken, missing screw, etc...)
- Cyanuric Acid
- Lifeguard Requirements
- Chemical Feeders Not Operational
- Spa Exceeds 104 Degrees Fahrenheit
- Fecal Accident
- Department Determination (health/safety hazard or disease)

#### Follow-up Procedures

Hendricks County Health Department will follow-up on:

1. Any disinfectant lower than minimum levels stated in Indiana State Department of Health 410 IAC 6-2.1 (the Pool Code)

2. Any main drains that are broken or missing

Operators may re-open facility on their own once violation(s) is/are corrected for any **other** closable offence.

### Hendricks County Statistics



### Hendricks County Closure Statistics



### 2018 Pool Closings - Hendricks



#### Post a sign when...





# Anyone else claustrophobic????



#### Disinfection levels (see section 1 in pool op training manual)

Pool Type	Chlorine	Bromine
Wader	3.0 – 7.0 ppm	4.0 – 10.0 ppm
Spa	2.0 – 7.0 ppm	4.0 – 10.0 ppm
Water slide plunge pools & Wave pools	2.0 – 7.0 ppm	3.0 – 10.0 ppm
All other pools	1.0 – 7.0 ppm	2.0 – 10.0 ppm

# Chlorine Characteristics (see section 1 in pool op training manual)

CHARACTERISTICS OF CHLORINES									
	GAS CHLORINE	SODIUM HYPOCHLORITE	CALCIUM HYPOCHLORITE	LITHIUM HYPOCHLORITE	DICHLOR	TRICHLOR			
% AVAILABLE CHLORINE	100%	12-15%	65-70%	35%	56% OR 62%	90%			
pH EFFECT	Lowers (pH <1.0)	Raises (pH 13.0)	Raises (pH 11.8)	Raises (pH 10.7)	Neutral (pH 6.9)	Lowers (pH 2.9)			
LOST TO SUNLIGHT	YES	YES	YES	YES	NO	NO			
PHYSICAL APPEARANCE	Gas	Liquid	Granular & Tablets	Powder	Granular	Granular & Tablets			



# Water Chemistry (see section 1 in pool op training manual)

What should your pH be?						
рН	7.2 – 7.8					
Ideal	7.4 – 7.6					
Closed	<6.8 or =/greater than 8.0					

## Water Chemistry...

Pool Chemistry	Range	Fix
Total Alkalinity	80 ppm – 120 ppm	Increase- add Sodium Bicarbonate (soda ash or baking soda) Decrease- add Sodium Bisulfate (acid)
Combined Chlorine	Less than .50 ppm	Drain and fill with fresh water Must shock if greater (Combined Chlorine x 10)
Cyanuric Acid	May not exceed 60 ppm	Drain and fill to decrease

\*Pool shall be closed for @ least 1 hour following manual addition of chemicals directly to pool water!

### What's wrong with this picture?



#### What's Wrong with this picture?



# Water Quality

 Sufficient clarity at all times to visibly see main drain or a 6 inch black disc from deck

Spas shall not exceed
 104 degrees Fahrenheit





#### Incidents

Indiana State Department of Health	Environmental Public Healt 2 North Meridian Street, 5-E Indianapolis, IN 46204
Swimming Pool Contamination In	ncident Record
410 IAC 6-2.1-38 requires that any fecal event occurring in the include the date and time, whether it involved formed stool or d levels at the time of observation of the event. Before reopenin levels, the procedures followed in response to the fecal acci increase chlorine levels (if required), and the chlorine contac record shall be kept for a minimum of one year, and be available	e pool be recorded. This record shall iarrhea, and the free chlorine and pH ag the pool, the free chlorine and pH dient, including the process used to t time must also be recorded. This e upon request by the department.
Date of incident:	Time:
Name of pool facility Name of person recording incident	
Contaminant was:Full stomach Vomit9	Solid fecalDiarrhea
Blood in the pool water*Body fluid on	pool deck surfaces*
Person responsible for the incidentIllNot ill	Not found
Free disinfectant (chlorine or bromine) at the time of the	event: pH:
	us
Pool was closed for minutes/hou	

Chlorine level was maintained at \_\_\_\_\_ppm for \_\_\_\_\_minutes/hours (contact time)

Free disinfectant residual prior to re-opening \_\_\_\_\_ ppm (Cannot exceed 7 ppm Chlorine)

pH prior to re-opening

\* Not required to record per 410 IAC 6-2.1-38(a)(7) \*\* Include process used to increase chlorine levels (if required). Make a report for each occurrence that:

- (1) Results in death;
- (2) Requires resuscitation;
- (3) Results in transportation to a hospital or other facility for medical treatment; or
- (4) Results in an illness connected to the water quality at the pool
- (5) The injury/illness report shall be forwarded to the HD within 10 days

## Fecal accidents (see section 2 in pool op training manual)

#### Solid stool & full stomach vomit

- Everyone out!
- Clean out matter (do not use vacuum)
- Test pool, add disinfectant (if needed) and reopen (if proper disinfection levels)
- Disinfect all equipment used
- Document

#### Nonsolid stool

- Everyone out!
- Clean out matter-Disinfect all equipment used (do not use vacuum)
- □ To drain or Not to drain?
- Document



### Why Disinfect?!

#### Germ Inactivation Time for Chlorinated Water\*

Germ	Time
E. coli O157:H7 (Bacterium)	Less than 1 minute
Hepatitis A (Virus)	About 16 minutes
Giardia (Parasite)	About 45 minutes
Crypto (Parasite)	About 15,300 minutes or 10.6 days†

\*1 parts per million (ppm) or mg/L free chlorine at pH 7.5 or less and a temperature of  $77^{\circ}F$  or higher.

+Shields JM, Hill VR, Arrowood MJ, Beach MJ. Inactivation of Cryptosporidium parvum under chlorinated recreational water conditions. J Water Health 2008;6(4):513-20.

#### **Records of operation**



SWIMMING POOL RECORD OF OPERATION State Form 12279 (R5 / 4-11) INDIANA STATE DEPARTMENT OF HEALTH

Pursuant to 410 IAC 6-2.1 and 38, this form must be logged daily and retained for one (1) year.

Name of facility	many m							x chang date (month, day, year)					er pour		
	DAILY						WEEKLY							Name of	
Day	Disinfectant Residual Cl <sub>2</sub> , Br <sub>2</sub> (ppm)		рН 7.2 – 7.8		Water Temperature	Combined Chlorine (TC-FC=CC)		Totai Aikaiinity	Cyanuric Acid	Bacter	iologic est	Breakpoint cl Superox CC ≥.5	hiorination / Idation ppm	Person Logging Entry	
	Opening	Second	Third	Opening	Second	Spa ≤104*F	First	Second	80-120 ppm	<60 ppm	Sample	Result	Amount Added	Cl <sub>2</sub> / non-Cl <sub>2</sub>	
Sunday															
Monday															
Tuesday															
Wednesday															
Thursday															
Friday															
Saturday															

Name of powder / solution use for disinfection

Day	Number of F Bathers	of Flow Rate s (gpm)	Flow Rate	Flow Rate	Flow Rate	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)	Bottom / Walls	Fresh Water Added	Filter Back Wash	Operating Period of Water Recirculation (What time of day did	Record	Chemic all chemicals u	al Usage used in pound	ds / gallons.	Remarks / Comments Fecal or vomit accident, maintenance and maifunction of equipment, shutdown of fitters or
			Cleaned?	(galions)		recirculation operate - hours?)	Acid	Soda Ash	Algacide	Other	disinfecting equipment, power failures, sickness, injuries or any other unusual conditions						
Sunday																	
Monday																	
Tuesday																	
Wednesday																	
Thursday																	
Friday																	
Saturday																	

Additional comments

#### **Records of operation**

Logged daily (keep minimum of 1 year)

Must contain a minimum of:

Disinfectant residuals & combined (2x per day)

- □ pH (2x per day)
- Total Alkalinity (1x per week)
- Combined Chlorine (2x per week)
- Cyanuric Acid (1x per week)

Record any time pool is closed Amounts of chemicals used Amount of water added

## 15 Minutes



### **Opening Inspections**

Sampling shall start at least one
 (1) week prior to opening of the pool

Satisfactory water sample prior to opening

Must be **no violations** on inspection report to receive permit

Public Health Inspectio	Hend Sw on based on 1 Hendricks C	iricks County Health Department vimming Pool Inspection Form Indiana State Department of Health 410 ounty Public Pool and Spa Ordinance 20	0 IAC 6-2.1 and 003-27
Pool Name: XXX fool Size: under 2000 sq. ft 2000 s Purpose: Routine	q. ft. and over Follow-up	Permit Number: Pool Type: Opening Complaint #	ZO15 ~ XX Dufdoor fool
Pool Water Chemistry (Section 30)         Operating Records         Test Kit         Free Chlorine	Sat. Unsat.	Lifesaving and Safety Equipment (Section 34) Life Pole Ring Buoy with Rope Spine Board with Straps and Head Immobilizer First Aid Kit with Two (2) Blankets Telephone Depth Markings Transition Line Lifeguards (Section 35) Lifeguards (Section 35) Lifeguard Platform or Chair Water Ouality /Cleaning (Sections 31 & 37) Main Drain Inside Surfaces Skimmers / Gutters Temperature 	Sat.       Unsat.       NA         Image: Constraint of the second
Section/Repeat	County	Violation Narrative time of inspection. Pool permit has been issu	ied
Health Department : Drvin Copy of Report Received by:	Brennen, C al Dal	70 Phone: Mad Date: 5	(317) 74 <b>5-92</b> 17 - <i>I - I 5</i>

### Other opening requirements...

- Operating records started for all pools
- Provide DPD test kit that stays on site
- □ All items stored 6 inches off of floor
- Toilet paper/covered waste receptacles
- Soap (no bar), hand drying provisions
- Hot and cold water @ hand sinks and showers (90° F -120° F)
- □ All signs (other slide)
- Lifesaving equipment (other slide)
- Main drains, clean inside surfaces and skimmers/gutters operational
- Depth Markers



#### Water Samples

1 water sample required weekly

Sampling shall start at least (1) week prior to opening

Health Department must receive sample reports from a state-approved lab

Closed if 2 consecutive unsatisfactory or 3 in a 6 week period

ns Courty Health Department Name:	q. ft. and over Follow-up	Permit Number: Pool Type: Opening Complaint #		
el Water Chemistry (Section 30) ierating Records st Kit te Chlorineppm mbined Chlorineppm Ital Alkalinityppm lcium Hardnessppm anuric Acidppm anuric Acidppm sinfectant Type termical Storage (Section 33) I terms at Least 6 Inches off Floor nitary Facilities (Section 29) pplies and Water fe and Sanitary Condition arring Signs (Section 36) er Sanitation and Safety Rules arring Signs	Sat. Unsat. Sat. Unsat. Sat. Unsat. Sat. Unsat. Sat. Unsat. Sat. Unsat. Sat. Unsat.	Lifesaving and Safety Equipment (Section 34) Life Pole Ring Buoy with Rope Spine Board with Straps and Head Immobilizer First Aid Kit with Two (2) Blankets Telephone Depth Markings Transition Line Lifeguards (Section 35) Lifeguards (Section 35) Lifeguards (Present Lifeguard Platform or Chair Water Quality (Cleaning (Sections 31 & 37) Main Drain Inside Surfaces Skimmers / Gutters Temperature	Sat. Unsat.  Sat. Unsat.  Sat. Unsat.  Sat. Unsat.  Sat. Unsat.  C. C	NA
(Section 31) S. U	/_/			7
	v	iolation Narrative		

## Lifesaving and safety equipment

Spine board w/ head immobilizer



#### **Depth markings**





Life pole/ shepherd's crook



Transition line (greater than 5ft)

#### Lifesaving and safety equipment...

#### Telephone within 200 ft





US Coast Guard approved ring buoy



First aid kit w/ 2-blankets Expired items should be replaced (Amazon is a good option for refills)

## Warning signs

cine	WHIRLPOOL ETIQUETIE	Pos vours sevenare
:	Please take a cleansing shower before entering, and refrain from using both lat	POA SOCIAL BENFORDA

Y BATHER

LOAD 7

- , children (under 18), or persons with heart disease, diabetes, and high or low blood pressure should refrain from using the whirlpool except under advice of a physician
- Avoid use while under the influence of alcohol, tranquilizers, or other drugs that are determined dangerous when used under conditions of high heat and humidity.
- Exposure greater than ten (10) minutes may result in drowsiness, nausea, or fainting. If you wish to return for another brief stay, do so after cooling down.
- Diving, jumping, playing and exercise in the whirlpool is prohibited.
- Please wait five (5) minutes after exercising before entering whirlpool.
- Users should refrain from submerging to the bottom of the whirlpool, as hair can become tangled in the drain. Appropriate swim attire must be worn in whirlpools.
- Please refrain from bringing food or drinks into this area. Use of the whirlpool immediately after eating is discouraged.
- · Please turn off the whirlpool when finished.
- Please safeguard your belongings. The YMCA is not responsible for lost or stolen items.

CARING \* HONESTY \* RESPECT \* RESPONSIBILITY

The YMCA of Greater





Anyone who has or has had diarrhea in the past two (2) weeks shall not use the pool.

- 2. Anyone who has an area of exposed subepidermal tissue, open blisters, cuts, etc. is advised not to use the pool.
- 3. All persons shall take a cleansing shower before using the pool. A bather leaving the pool to use the toilet shall take another cleansing shower before returning to the pool enclosure.
- 4. Spitting, spouting of water, blowing the nose. and similar behavior in the pool is prohibited
- 5. No running or rough play is permitted in the pool, on the runways, on diving boards, on floats, on platforms, in dressing rooms, or in showers.
- 6. Street clothes are not allowed in the pool.
- 7. All diaper aged children shall use plastic pants with tight fitting elastic at the legs and waist, or swim diapers.
- 8. Do not change diapers at poolside.

#### Bathing load 350 persons

THE MANAGEMENT RESERVES THE RIGHT TO REFUSE ADMITTANCE TO, OR EJECT FROM THE POOL PREMISES, ANY PERSONS FAILING TO COMPL WITH ANY OF THE ABOVE HEALTH AND SAFETY REGULATIONS.



# Lifeguards

- Required for all **PUBLIC** pools
- Required for all SEMI-PUBLIC pools with surface area of 2,000 sq. ft. or more
- Must be on duty @ poolside @ all times when open for use

Bather Load	Minimum Number of Lifeguards
0–75	1
76–150	2
151–225	3
226–300	4
301–375	5

\*When the bather load exceeds three hundred seventy-five (375), one (1) lifeguard shall be provided for each additional seventy-five (75) bathers or fraction thereof.

# Calculating Gallons in Pools



### Pool Volume



Length = 20 feetWidth = 15 feetDepth 1 = 3 feetDepth 2 = 9 feet

Length x width x average depth x 7.5 = volume (in gallons)

20ft x 15ft x 6ft x 7.5 = 13,500 gallons

### Pool Surface Area

Length = 35 feet Width = 20 feet

Length x Width = Surface Area

35 ft x 20 ft =

700 square feet

### When & How to add Chemicals

#### **Pool Chemical Formulas**

Gallons:	Pool Occupancy:		
Increase Chlorine			
Calcium Hypochlorite	.125 x ppm change x pool volume ÷ 10,000 = pounds		
Sodium Hypochlorite	.1016 x ppm change x pool volume + 10,000 = gallons		
Lithium Hypochlorite	.250 x ppm change x pool volume ÷ 10,000 = pounds		
Decrease Chlorine			
Sodium Sulfite	.2 x ppm change x pool volume ÷ 10,000 = pounds		
Sodium Thiosulfate (dechlor)	.0625 x ppm change x pool volume ÷ 10,000 = pounds		
Increase pH			
Sodium Carbonate (Soda Ash)	.186 x ppm change x pool volume ÷ 10,000 = pounds		
Caustic Soda	.094 x ppm change x pool volume ÷ 10,000 = pounds		
Decrease pH			
Muriatic Acid/Hydrochloric Acid	.5 x ppm change x pool volume ÷ 10,000 = gallons		
Sodium Bisulfate	.05 x ppm change x pool volume ÷ 10,000 = pounds		
Increase Total Alkalinity			
Sodium Bicarbonate (Baking Soda)	.15 x ppm change x pool volume $\div$ 10,000 = pounds		
Decrease Total Alkalinity			
Muriatic Acid/Hydrochloric Acid	.016 x ppm change x pool volume ÷ 10,000 = gallons		
Sodium Bisulfate	.16 x ppm change x pool volume ÷ 10,000 = pounds		
Decrease Stabilizer			
Drain and fill with fresh water			

Basic conversion \*dry and liquid Conversions are not interchangeable\*

1 lb (pound) = 16 ounces (Dry)

128 fl.oz. = 1 gallon (Liquid)



Hendricks County Health Department Environmental Health Division

Hendricks County Government Center 355 South Washington Street, #210 Danville, IN 46122 Office: (317) 745-9217 Fax: (317) 745-9218 www.co.hendricks.in.us After testing and confirming a chemical level is incorrect!

**\*\*Follow all directions on manufacturer labels**\*\*

Know where to add each chemical

-directly to pool water? -through a feeder?

#### Water Chemistry Adjustments

#### Water Chemistry Adjustment Guide

These are commonly accepted chemical parameters. Consult product labels for specific directions for chemical adjustments. The manufacturer's instructions must always be followed.

Dosages to Treat		10,000 Gailons	
Chemical		Desired Change	
Increase Chlorine	1 ppm	5 ppm	10 ppm
Chlorine Gas	1.3 oz	6.7 oz	13 oz
Calcium Hypochlorite (67%)*	2 oz	10 oz	1.3 lb
Sodium Hypochlorite (12%)	10.7 fl.oz.	1.7 qts	3.3 qts
Lithium Hypochlorite	3.8 oz.	1.2 lbs	2.4 lbs
Dichlor (62%)	2.1 oz	10.75 oz	1.3 lbs
Dichlor (56%)	2.4 oz	12 oz	1.4 lbs
Trichlor	1.5 oz	7.5 oz	14 oz
Increase Total Alkalinity	10 ppm	30 ppm	50 ppm
Sodium Bicarbonate	1.4 lbs	4.2 lbs	7.0 lbs
Sodium Carbonate	14 02	2.6 lbs	4.4 lbs
Sodium Sesquicarbonate	1.25 lbs	3.75 lbs	6.25 lbs
Decrease Total Alkalinity	10 ppm	30 ppm	50 ppm
Muriatic Acid (31.4%)	26 fl.oz.	2.4 qts	1 gal
Sodium Bisulfate	2.1 lbs	6.4 lbs	10.5 lbs
Increase Calcium Hardness**	10 ppm	30 ppm	50 ppm
Calcium Chloride (100%)	0.9 bs	2.8 lbs	4.6 lbs
Calcium Chloride (77%)	1,2 lbs	3.6 lbs	6.0 lbs
Increase Stabilizer	10 ppm	30 ppm	50 ppm
Cyanuric Acid***	13 oz	2.5 lbs	4.1 lbs
Neutralize Chlorine	1 ppm	5 ppm	10 ppm
Sodium Thiosulfate	2.6 oz	13 mz	26.07
Sodium Sulfite	2.4 02	12 02	1.5 lbs

Chamical amounts have been retained off. A ways follow instructions on the manufacturer's abel for exact dosage amounts. This table was adapted from the National Swimming Pool Foundation/D Pool & Spa Operator <sup>70</sup> Hamiltonic.

\*Other calcium hypothlorite products are available from 47% to 78%. Follow the label directions for dosage amounts or calculate the dosage using example 2 in the no product label chemical adjustment section.

\*\* The only way to reduce calcium hardness is to remove some of the pool water.

•• \*The only way to reduce the level of cyanuric acid in the water is to drain and rofill the pool with fresh water. Studies have shown that cyanuric acid residual remains in the plaster, filter elements and media, and scale in heaters and pipes.

Amount of Chemical from appendix B-2 or	Actual Pool Volume in Gallons	Desired Chemical Change	Total	3. Essential
product label)				Galculations
				4, Pool Water Contamination
	÷ 10,000 Gallons (From appendix B-2	÷ ppm (From appendix B-2		<ul> <li>9. Disinfection</li> <li>4. Wester Polynomial</li> </ul>
+	or product label)	or product labely		-
	x	x	=	7. Pool & Spa Water Problems
	L			8. Ghemical
a ha as				Testing
otes:				Testing 9. Chemical Feed & Control
otes:				Testing 9. Chemicel Feed & Control 10. Water Cliculation
otes:	1			Tasting 9. Chemical Feed & Control 10. Water Circulation 11. Pool & Spa
otes: effic Amount of Chemical rom appendix 8-2 or product label)	Actual Pool Yolume in Liters	Desired Chemical Change	Total	Testing     Chemical Feed &     Control     To: Water     Cheviation     Theviation     Theviation     Theviation     Theviation     Theviation     Theviation     Theviation     Theviation     Theviation
otes: Hric Imount of Chemical rom appendix R-2 or product label)	Actual Pool Yolume in Liters	Desired Chemical Change	Total	Othermicel Feed S     Control     Control     To: Water     Cheviation     Theretation     The Pool & Spa     Finration     Televiation     San & An     Cheviation     San & Therapy     Operations
ofes: elfic from appendix 8-2 or product (abel)	Actual Pool Yolume in Liters + 40,000 Liters (From appendix B-2	Desired Chemical Change ÷ mg/L (From appendix B-2	Total	Chemical Feed & Control     Control     Control     Control     Cheviation     Cheviation     Cheviation     Cheviation     Cheviation     Spa Shir Cheviation     San Shir Cheviation     San Shir     Cheviation     San Shir     San Shi
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ofes: Infic Amount of Chemical rom appendix 8-2 or product label)	Actual Pool Yolume in Liters + 40,000 Liters (Firom appendix B-2 or product label) X	Desired Chemical Change + mg/L (From appendix B-2 or product label) X	Total	<ul> <li>Testing,</li> <li>Chomical Feed &amp; Control</li> <li>University of the Control of Control</li> <li>10. Weller</li> <li>11. Paol &amp; Spa Filtration</li> <li>12. Heating &amp; Air Circulation</li> <li>13. Star &amp; Therapy Operations</li> <li>14. Facility Safety</li> <li>15. Kamping Reports</li> <li>16. Maintenance Systems</li> <li>17. TroutNeshooting</li> </ul>

# **Adding Chemicals**



#### Where to get water for testing?

- Do not take water around blowers, jets, suction outlet cover or skimmer baskets
- □ Try to go 18 inches down or until elbow is under the water
- Take sample where shallow end transitions to deep end



#### **Turnover Rate**

#### **Spa:** Every 30 minutes

#### Pools (build after 1989):

- Wading- 1 hour
- Wave, Zero depth, pools w/ wading areas- 2 hours
- Competition- 6 hours
- Diving-12 hours
- All others- 6 hours



#### Flow Meter



Flow Meter: a device for measuring the rate of water passing through a given pipe, expressed in gallons per minute (gpm).

#### Flow Rate



**Flow Rate:** The volume of water passing a given point in a given time, expressed in gallons per minute (gpm). The flowmeter must be located on a longer section of straight pipe in order to properly measure the flow rate.

#### Backwash

**Backwash:** the process of running water through a filter in the reverse direction to flush the filter of debris and contaminants, freeing up the filter to be less restricted so the water can pass through the filter more efficiently, collecting more debris.

\*\*Always open any air bleed valves and turn off the pump before changing valve positions. Also turn off any safety vacuum release equipment, if applicable\*\*



### Backwash

**Sand Filters:** backwashing is required when water entering filter and water exiting filter reaches a 10-20 psi difference (note by observing pressure gauges on each side of filter flow, if only 1 pressure gauge, should noted starting pressure and backwash when pressure increases 8-10 psi).

**Pressure Diatomaceous Earth (DE):** When pressure reaches 10 psi higher than cycle starting pressure on a single gauge operation the filter must be cleaned. Backwash is accomplished with use of valves or a multi-port valve, water flow is reversed, diverted to separation tank, then to waste. Turn off pump and restart, repeat backwash cycle 3 x's.

**Manual DE:** Follow manufacturer's instructions for pulling grids from filter, spraying grids (inspect for tears/damage), soaking elements in a cleaner, and reassemble.

\*\*Allows follow written directions of filter manufacturer no matter what type you have.

\*\*Watch any sight glass or discharge until water runs clear!



#### Testing the waters!

#### Let us show you some pointers!





\*Clean test tubes & replace when discolored! \*Contamination in tubes can effect chlorine levels! \*Check your reagents often & replace when expired!

# Videos – Taylor Technologies

#### **Good Sampling Techniques**

**Chlorine** 

<mark>рН</mark>

pH Interference

**Total Alkalinity** 

**Total Alkalinity Interference** 



## **Certified Pool Operator**





https://www.nspf.org/course-locations

# Splash Pads

- Becoming extremely popular
- Current Hendricks
   County Splash Pads:
- Washington Township and Hummel Parks are fresh water pads where waste goes directly to sanitary sewer
- Williams Park
   Watermill and The Shops @ Perry Crossing are on recirculated systems



# Sun Safety

- Project from environmental conference
- □ Sun safety tips
- Made specifically for each location.
- Please consider hanging next to phone.



# Dog Swims



#### ISDH Dog Swim Guidelines



### Special Thanks!!!

#### **Plainfield Aquatic Center**

Nick Fisher – Aquatic Supervisor

Brent Bangel – Director

Jordan Brouillard – Aquatic Manager

Indiana State Department of Health Diana Peterson – Field Staff



#### Hendricks County Pool School

#### **Questions & Answers**



## **Contact Information**

If anyone has questions please don't hesitate to contact us.

Devin Brennan, CPO 317-718-6012 <u>dbrennan@co.hendricks.in.us</u> Sarah Dallas, CPO

> 317-718-6011 sdallas@co.hendricks.in.us

\*Or call our office and ask for a CPO\* 317-745-9217