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**Arkansas Department of Health**

Environmental Health Protection

**GUIDELINES FOR ARKANSAS  
POOLS, SPAS, AND OTHER  
AQUATIC FACILITY OPERATORS**

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*A Comprehensive Reference for Commercial Aquatic Facility Operations*

Updated Edition — 2026

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*This manual has been compiled using information from:*

*Arkansas Rules and Regulations Pertaining to Swimming Pools and Other Related Facilities (2012), Model Aquatic Health Code (MAHC), 5th Edition, CDC publications, and other industry-related publications and standards.*

Technical review and revised by Forrest Montgomery

## Introduction and Regulatory Compliance

### Purpose and Scope

If you're reading this, you're responsible for keeping people safe in the water. This manual provides everything you need to operate a safe, clean, and legal aquatic facility in Arkansas. We wrote it in plain language, so you do not need a chemistry degree to take care of a pool. But the science matters, and the details can mean the difference between a healthy swimming experience and a serious illness outbreak or death.

### Regulatory Authority

Arkansas Act 623 of 1987 (as amended) — Arkansas Department of Health (ADH) authority over all public pools
ADH Rules & Regulations (effective August 1, 2012) — Your everyday rulebook for inspections and compliance

### Annual Permit Requirements

PERMIT REQUIREMENTS
No facility may operate without a valid annual permit and a pre-opening inspection from ADH
Permits expire December 31 each year; fees due January 1
Call your local health unit 7-10 days before seasonal opening for inspection
Violations: \$50–\$500 per offense per day (AR Section XXIX). Each day counts separately.

## Plan Review Requirements

***Before you build a new pool, remodel an existing one, or change out major equipment, you need approval from the Arkansas Department of Health. No part of the work shall begin until written approval is granted.***

Plan review required: All new pool/spa/water attraction construction. Any remodel replacing recirculation components (plumbing, overflow/skimmer equipment, pumps, filters, or disinfection units). Any modification to the physical structure. Any change that doesn't conform to the original approved specs.

NOT usually required for: Repair of small pipe sections due to leaking. Maintenance like painting, plastering, or acid washing. Replacement of equipment with identical models (but still notify local EHS).

*The full Plan Review Checklist is included in the Appendix. Incomplete submissions or lack of notifications are cause for delays in opening a facility.*

#### FROM THE FIELD:

**Example 1:** A hotel replaced its 3 HP pump A with a 3 HP variable-speed pump B without notifying ADH. The EHS flagged it as an unapproved modification. It had different pump manufacturers, even though the pumps have the same horsepower, but that doesn't mean the same output. Save yourself the headache — call first.

**Example 2:** Filter Model 123 was replaced with Filter Model 456. Not the same Filter and Model #. Must go through plan review to make sure it will work for your pool and is required to be reviewed due to possible risk and change in pool hydraulics.

## Legal Liability Related to Swimming Pool Operators

Key Legal Term	Definition
<b>Liability</b>	Legal responsibility, especially when negligence is a factor in an injury occurrence.
<b>Plaintiff</b>	The person who has been injured and who brings a lawsuit.
<b>Defendant</b>	Person or organization whom the plaintiff charges was responsible for the injury.
<b>Action for Tort</b>	A legal action brought by a plaintiff to obtain compensation for injuries.
<b>Negligence</b>	The defendant acted improperly or failed to act properly. To establish negligence, the plaintiff must prove: (1) A duty of care existed, (2) the defendant breached that duty, (3) the breach caused the injury, and (4) Actual damages resulted.
<b>Standard of Care</b>	The level of care, caution, and diligence a reasonable person in the same position would exercise under the same circumstances.
<b>Attractive Nuisance</b>	A condition on property that may attract children and pose a danger to them. Pools are considered attractive nuisances under the law, creating a heightened duty of care.

### Reducing Legal Exposure

Pool operators can significantly reduce their legal risk by maintaining high operational standards:

- Maintain complete, accurate daily records of water chemistry, inspections, incidents, and maintenance.
- Follow all applicable regulations, codes, and manufacturer instructions.
- Train staff thoroughly and document all training, including dates, topics, and attendees.
- Post all required signage: rules, depth markers, no diving, no lifeguard, and emergency phone numbers.
- Maintain all safety equipment in good working condition.
- Carry adequate liability insurance.
- Report all incidents and accidents promptly, including near-misses.
- Complete and retain the ADH Accident/Drowning Report form for every incident.

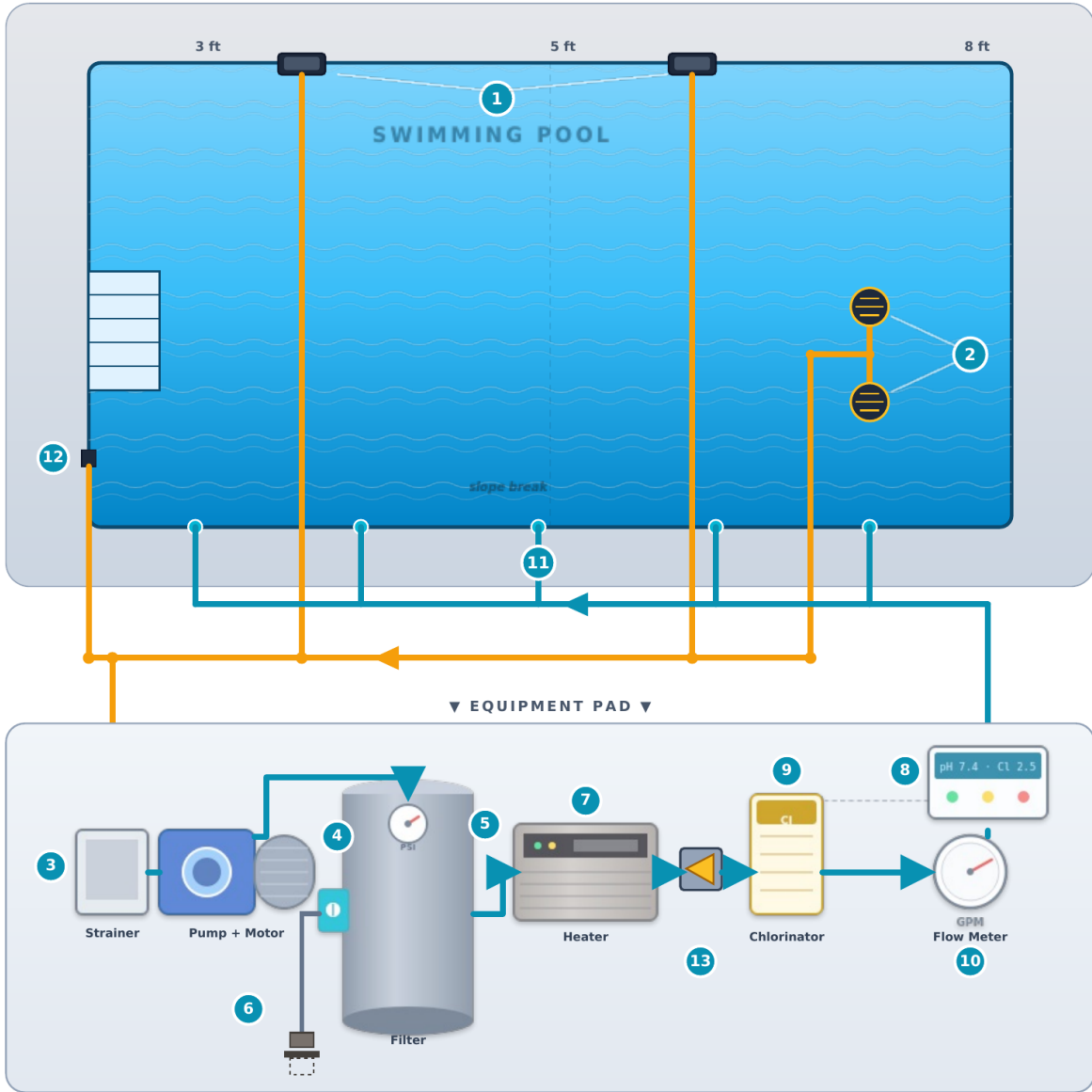
### Facility Staff Concerns

- The pool operator is responsible for all staff training, such as assigned duties, lifeguards' (if required by classification) certification, chemical safety, SDS interpretation, emergency response procedures, and enforcing the Arkansas Rules and Regulations.
- Pool staff must follow all ADH regulations and any additional facility rules set by management.
- The pool operator is responsible for the overall health and safety of pool staff.
- Pool staff should not work while experiencing diarrhea, vomiting, open wounds, or infectious skin conditions.

**Documentation:** In a lawsuit, what you cannot prove did not happen. Written records, photos, and training documentation are your best defense. If you did not write it down, from a legal perspective, it did not happen.

## Swimming Pool Recirculation System

Arkansas commercial pool reference · Water flow path and major components



### LEGEND · COMPONENT KEY

→ SUCTION (pool → pump)

→ RETURN (pump → pool)

**1 Skimmer (x2)**

pulls water from the surface

**2 Main Drains — VGB dual**

pulls water from the bottom

**3 Hair & Lint Strainer**

catches debris before pump

**4 Pump + Motor**

moves all water in the system

**5 Filter**

removes fine particles (sand/cart/DE)

**6 Backwash w/ air gap**

≥ 6" gap to sanitary sewer

**7 Heater**

gas / heat pump / electric

**8 Chemical Controller**

auto-monitors pH and chlorine

**9 Chlorinator / Sanitizer**

adds disinfectant to water

**10 Flow Meter**

verifies turnover rate (GPM)

**11 Return Inlets**

sends clean water back to pool

**12 Vacuum Line**

tees into suction line

**13 Check Valve**

prevents chemical back-feed

**Ⓢ SURFACE SKIM ALTERNATIVE**

Some pools use perimeter overflow gutters paired with a surge / balance tank instead of skimmers — common on competition or high-bather-load pools. (MAHC § 4.7.3.4.1)

**⚠ ARKANSAS REQUIREMENT**

Equalizer lines are NOT permitted on Arkansas commercial pools (entrapment hazard — unprotected secondary suction).

**WATER FLOW PATH: Pool → 1, 2, 12 → 3 → 4 → 5 → 7 → 13 → 9 → 10 → 11 → Pool**

Ref. Arkansas Swimming Pool Regs (2012) · MAHC 5th Ed. § 4.7.3 · ASME A112.19.8 (VGB)

## Pool Water Chemistry

Proper water chemistry is the foundation of safe aquatic facility operation. Balanced water protects bather health, prevents equipment damage and illness, and keeps the pool attractive and inviting.

### **pH**

pH measures how acidic or basic the water is on a scale of 0 to 14. Pool water should be maintained between 7.0 and 7.8, with an ideal range of 7.4 to 7.6 (per AR Appendix B). Alkalinity in the right range helps keep pH from bouncing. *Chemically adjusting the pH range in your pool water can usually be done using your test kit readings and the provided kit charts.*

#### **pH affects nearly every aspect of pool operation:**

- Chlorine efficiency on Bacterial Kill Rate: Chlorine is most effective at lower pH ranges. At pH 7.2, about 63% of free chlorine is in an active killing form (hypochlorous acid). At pH 7.8, only about 33% is active.
- Bather comfort: Eye and mucous membrane irritation increases outside the 7.2–7.8 range.
- Corrosion: Low pH (below 7.0) corrodes metal pipes, heat exchangers, and pump components.
- Scale formation: High pH (above 7.8) causes calcium to precipitate out of solution, forming white scale on surfaces, inside pipes, and on heat exchanger surfaces.
- Water clarity: High pH can cause clouding and discoloration of pool water.
- Algae growth: Algae thrive in higher pH environments with insufficient sanitizer.

#### **Factors Affecting pH:**

- Gas chlorine lowers pH (forms hydrochloric acid in water).
- Sodium hypochlorite (liquid chlorine) and calcium hypochlorite raise pH.
- Makeup water may affect pH depending on source water chemistry.
- Windblown dust, debris, and bather contaminants (sweat, urine, sunscreen) can shift pH.
- Rain is typically acidic (pH 5.0–5.5) and can lower pool pH after storms.
- Heavy bather loads introduce CO<sub>2</sub> and organic waste that can shift pH.

pH Level	Active killing form of Chlorine present at 77F (will vary with temp. & CYA)	What You'll Notice
7.0	~73%	Aggressive water — corrodes metal, etches plaster, stings eyes
7.2	~63%	Good killing power but slightly corrosive if alkalinity is low
7.4–7.6	~50–58%	Best balance range of disinfection, comfort, and equipment protection
7.8	~33%	Scale starts forming, water gets cloudy, you're wasting chlorine
8.0	~21%	Very poor disinfection — you'll fight algae and burn through chemicals

**Example:** pH reads 7.0, need 7.4. Pool is 40,000 gal. Pool Kit Chart shows: 8 oz soda ash/10k gal. How much to add?

$$40,000 \div 10,000 = 4 \text{ ---> Total: } 4 \times 8 = 32 \text{ oz (2 lbs) soda ash.}$$

## **Total Alkalinity**

Total alkalinity (TA) measures the water's ability to resist pH changes. It acts as a pH buffer. When TA is in the proper range, the pH is more stable and easier to control. When TA is too low, pH bounces up and down unpredictably. When TA is too high, pH tends to drift upward and is difficult to lower.

The ideal TA range depends on the sanitizer used. For calcium, lithium, and sodium hypochlorites, the ideal range is 80–100 ppm. For sodium dichlor, trichlor, chlorine gas, and bromine compounds, the ideal range is 100–120 ppm (per AR Appendix B). Minimum is 60 ppm; maximum is 180 ppm.

**Why It Matters:** Without enough alkalinity, even a small chemical addition can send the pH swinging wildly. This makes maintaining water balance nearly impossible. Alkalinity is recommended as the first chemical to adjust if out of balance.

## **Calcium Hardness**

Calcium hardness measures the amount of dissolved calcium in the water. Water that is too soft (low calcium) becomes aggressive and will dissolve calcium from plaster, grout, and concrete pool surfaces. Water that is too hard (high calcium) deposits scale on surfaces and inside equipment. (Ex. heater coils, etc)

*Operation of pools at maximum hardness depends on the alkalinity & pH buffering requirements of the sanitizer used. Minimum alkalinity & lower pH must be used with maximum hardness (over 500 ppm).*

## **Cyanuric Acid (Stabilizer)**

Cyanuric acid (CYA), also called stabilizer or conditioner, protects chlorine from destruction by UV sunlight. Without CYA, sunlight can destroy up to 90% of free chlorine in outdoor pools within 2hrs.

### *The CYA-Chlorine Relationship*

CYA binds with free chlorine. While this protects chlorine from sunlight (UV) destruction, it also reduces the percentage of chlorine that is available to kill germs. With CYA at 25–40 ppm, chlorine lasts 3–10 times longer. With 30 ppm CYA, approximately 3% of free chlorine is in the active (hypochlorous acid) form at pH 7.5. At 90 ppm CYA, only about 1.5% is active. This means higher CYA requires higher free chlorine to maintain the same killing power. The MAHC & ADH recommend that CYA not exceed 90 ppm for standard pools.

*High Cyanuric Acid levels can also mask your actual alkalinity reading, making it appear higher than it is.*

**MAHC Guidance:** It is recommended that 15-20 ppm CYA with a minimum 3-5ppm free chlorine be used for increased-risk venues (splash pads, spray features, wading pools).

### *CYA Creep: How It Happens*

Stabilized chlorine products (dichlor and trichlor) add CYA to the water every time they are used. CYA does not evaporate, break down, or get filtered out. It accumulates over time. This is called CYA creep.

Each pound of trichlor adds approximately 6 ppm of CYA to 10,000 gallons of water.

If you use 3 lbs/week in a 50,000-gallon pool:  $CYA\ added\ per\ week = (3\ lbs \times 6\ ppm) \div 5 = 3.6\ ppm\ per\ week$

After 25 weeks/ 1 season): CYA could be 90 ppm from trichlor alone, plus any CYA was already present.

## **How to Control CYA**

- Use unstabilized chlorine (liquid sodium hypochlorite or cal-hypo) as the primary sanitizer.
- Add CYA separately, only as needed, to maintain 25–40 ppm in outdoor pools.
- Test CYA at least weekly during the operating season.
- Anything above 50ppm CYA is considered high and can interfere with other pool chemicals' effects and equipment. (i.e. alkalinity reading, chlorine's killing time, ORP probe sensors, etc.)

**Warning:** CYA does not break down or evaporate. The only way to lower CYA concentration is to drain and dilute with fresh water. Overuse of stabilized chlorine products (dichlor and trichlor) gradually raises CYA to problematic levels. It can interfere with other pool chemicals and readings.

**Best Practice:** A stabilizer is not needed in indoor pools or bromine pools. Only use CYA in outdoor chlorinated pools.

## **Total Dissolved Solids**

Total dissolved solids (TDS) are the sum of all dissolved substances in the water, including minerals, salts, chemical byproducts, and organic material. As water evaporates, TDS increases because the dissolved substances remain behind. Excessively high TDS (above 3,000 ppm) may lead to hazy water, corrosion of fixtures, and reduced sanitizer effectiveness. The ideal range is 1,000–2,000 ppm, with a minimum of 300 ppm (per AR Appendix B).

High initial TDS may indicate poor source water quality due to mineral salts, humus, or organic matter. Consult your local water authority for source water analysis.

**Operator Tip:** If TDS exceeds 3,000 ppm, the most effective correction is to partially drain and refill with fresh water. There is no chemical treatment to lower TDS. Special Note: Saltwater pools will have higher TDS levels. The salt in the water will register as TDS when measuring. So, initial TDS (fresh from the tap) plus the salt ppm levels is your regular operating TDS. Once levels rise above that number (~3000 ppm), dilute the volume.

## **Metals**

Metals such as copper, iron, and manganese can enter pool water through source water, corroded metal piping, or copper-based algaecides. If present, these metals can cause staining of pool surfaces, water discoloration (green from copper, brown from iron), rapid chlorine dissipation, and filter plugging. There is no established minimum or maximum in the AR parameters, but the presence of metals warrants attention. The metal coloration is most likely due to high chlorine levels (e.g., breakpoint chlorination), which cause metals in the water to appear colored. Specialty chemicals, such as chelating and sequestering agents, would need to be used to make the color disappear.

**Operator Tip:** If you can see through the colored water down to the bottom of the pool, then it is most likely a metal causing the discoloration. If you cannot see to the bottom of the colored water, it is most likely an algal bloom in your pool.

## **Oxidation Reduction Potential (ORP)**

ORP is an electronic measurement of the water's overall sanitizing strength, expressed in millivolts (mV). When chlorine or bromine is the primary disinfectant, ORP provides a supplemental, real-time measurement of sanitizer activity. It does not replace manual testing with a DPD test kit.

The minimum ORP reading per AR parameters is 650 mV. ORP readings are affected by pH, probe condition, cyanuric acid level, and other factors. Follow the manufacturer's recommendations for calibration and maintenance of ORP sensors.

**AR Regulation:** ORP testing does not eliminate or supersede the need for manual testing of sanitizer levels with standard DPD test kits (AR Appendix B). Water testing must be performed by a human using a DPD test kit at least once a day for the required water parameters.

## **Characteristics of Chlorine Disinfectants**

Each chlorine product has different properties that affect how it behaves in pool water. Understanding these differences helps operators select the right product and anticipate its effects on pH, alkalinity, and stabilizer levels. Knowing these effects and information can help you determine which chemicals you will need more of on hand, and which are most likely to dose the water later on.

Property	Gas Chlorine	Sodium Hypo (liquid)	Lithium Hypo	Calcium Hypo	Dichlor	Trichlor
% Available Cl <sup>-</sup>	100%	10–12%	35%	65–78%	56% or 63%	90%
pH Effect	Lowers	Raises	Raises	Raises	Neutral	Lowers
Alkalinity Effect	Decreases	Increases	Increases	Increases	None	Decreases
Physical Form	Gas	Liquid	Granular	Granular/tablet	Granular	Tablet/stick
Contain Stabilizer (protects from sunlight)	No	No	No	No	Yes	Yes

**NEVER MIX:** Never allow different chlorine products to come into contact with each other, with acids, or with organic materials. (Ex. Mixing cal-hypo with trichlor can cause an explosive fire.)

**Note:** Calcium Hypochlorite is the only chlorine product that adds calcium to your pool.

## **Other Disinfectant Alternatives**

Chlorine and Bromine are the only two allowed primary disinfectants/sanitizers. Other such things like iodine, polyhexamethylene biguanide (PHMB), chlorine dioxide, copper/silver ionization, and other chlorine alternatives are not acceptable in commercial applications. They have some benefits but several disadvantages too. Such chemicals tend to react badly with chlorine as well.

## Specialty Chemicals for Pools and Spas

Chemical Type	Purpose	Notes
<b>Clarifiers</b>	Coagulate tiny particles for easier filtration	Improves water clarity. Do not overdose—excess can cause hazy water.
<b>Flocculants (Floc)</b>	Settle suspended particles to pool floor	Must be vacuumed to waste. Do not use in cartridge filter systems.
<b>Sequestering/Chelating Agents</b>	Bind metals (iron, copper, manganese) to prevent staining	Use when filling from well water or after detecting metals.
<b>Enzyme Products</b>	Break down oils, lotions, and organic scum	Reduces scum lines and filter loading. Supplement, reduces chloramines; not replacement for sanitizer.
<b>Phosphate Removers</b>	Remove phosphates that feed algae	Reduces algae food source. Use as part of integrated prevention program.
<b>Tile and Surface Cleaners</b>	Remove scale, scum, and stains from surfaces	Use pool-specific products. Never use household cleaners in pool water.
<b>Non-Chlorine Shock (MPS)</b>	Oxidize organic contaminants without chlorine	Potassium monopersulfate. Short reentry time. Cost-effective for small pools.
<b>pH Adjusters</b>	Raise (soda ash) or lower (muriatic acid, sodium bisulfate) pH	Always add acid to water, never water to acid.
<b>Alkalinity Adjusters</b>	Raise (sodium bicarbonate) or lower (muriatic acid) total alkalinity	Adjust alkalinity before pH. pH is easier to control once alkalinity is stable.
<b>Borate Products</b>	Buffers pH; inhibits algae	Ongoing at 30-50 ppm; Cuts acid use 50%; stays until diluted
<b>Mineral Ionizers</b>	Releases Cu/Ag ions	Cannot be used in place of sanitizer. Manufacturers claim it can reduce Cl need 50-80%; Cu <0.2 ppm. Possible water discoloration.

## Algaecides

Type	Best For	Pros	Cons
<b>Quaternary Ammonium</b>	Green algae prevention	Inexpensive	Causes foaming
<b>Polyquats (Poly 60)</b>	All-purpose	No foaming; clarifies	Higher cost
<b>Copper-Based</b>	Stubborn algae	Very effective	Can stain; discolors hair
<b>Sodium Bromide</b>	Yellow/mustard algae	Targets resistant strains	Expensive; specialized
<b>Phosphate Remover</b>	Prevention	Removes algae food source	Ongoing cost

## Arkansas Pool Chemical Operational Parameters

**\*Mandatory tests for compliance    \*\*Test when suspect**

Disinfectant Levels* Free Chlorine, ppm	Min	Ideal	Max	Comments	Test Interval
<b>Pool*</b>	1.0	1.0 – 3.0	5.0	Hot weather/heavy use may require operation at or near max levels. Must run more free chlorine residual if using Cyanuric acid/stabilizer	Daily
<b>Spa*</b>	2.0	3.0 – 5.0	5.0		
<b>When stabilizer is used</b>	1.5	—	5.0		

Disinfectant Levels* Combined Chlorine, ppm	Min	Ideal	Max	Comments	Test Interval
<b>Pool</b>	None	None	0.2	High combined chlorine means reduced sanitizer effectiveness. Other signs: sharp chlorine odor, eye irritation, algae growth. Take remedial action to breakpoint chlorinate.	Weekly
<b>Spa</b>	None	None	0.2		

Disinfectant Levels* Bromine, ppm	Min	Ideal	Max	Comments	Test Interval
<b>Pool*</b>	2.25	2.25 – 4.0	4.0	Used indoors due to easily destroyed by sunlight. Is better for warmer water use.	Daily
<b>Spa*</b>	2.25	3.0 – 5.0	5.0		

Chemical Values	Min	Ideal	Max	Comments	Test Interval
<b>pH*</b>	7.0	7.4 – 7.6	7.8	Too high: low chlorine efficiency, scale, cloudy water. Too low: corrosion, eye discomfort, plaster etching.	Daily
<b>Total Alkalinity* (ppm as CaCO<sub>3</sub>)</b>	60	80–100 Unstabilized 100–120 Stabilized	180	Range depends on sanitizer type and if CYA is present. See Total Alkalinity section.	Daily
<b>Cyanuric Acid* (ppm)</b>	None	25 – 40	90	Not needed for indoor pools or bromine. High concentration reduces chlorine effect	Weekly
<b>Total Dissolved Solids (ppm)</b>	300	1,000 – 2,000	3,000	High TDS may cause hazy water and corrosion. Correct by dilution.	Monthly
<b>Calcium Hardness** (ppm)</b>	150	200 – 400	500–1,000	Use minimum alkalinity and lower pH at max hardness (over 500 ppm).	Monthly
<b>Heavy Metals**</b>	None	None	—	If present: staining, discoloration, chlorine loss, filter plugging.	Suspect
<b>Temperature — Spa *</b>	—	—	104°F	For 15-minute intervals on a timer.	Daily
<b>ORP (mV)</b>	650mV	—	—	Supplemental measurement. Does not replace manually testing with the DPD test kit.	Daily

## Water Testing and Balancing Tips

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### Seasonal Opening

- Complete a full water analysis with each seasonal opening of the pool.
- Test for free chlorine, combined chlorine, pH, total alkalinity, calcium hardness, cyanuric acid (outdoor pools), and temperature.
- Compare results to the AR Chemical Operational Parameters table.

### Sample Collection

- Collect water samples 18 inches below the pool surface, away from return inlets.
- When using a test kit comparator block, do not use your finger to cap the test tube when gently agitating to mix.
- Compare test results against a white background in natural light for the most accurate color reading.

### Reagent Care

- Replace test kit reagents yearly. Expired reagents give false readings.
- Store the test kit out of direct sunlight and away from extreme heat, cold, acids, and chlorine.
- Never interchange reagent bottles between different test kits or manufacturers.

### Testing Frequency

- Test disinfectant, pH, and Alkalinity daily at least once as required.
- Test pH and free chlorine daily and 2-3 times daily when the pool has heavy use.
- Test total alkalinity more often if pH is difficult to control.
- Test calcium hardness monthly or at seasonal opening.
- Test cyanuric acid weekly (outdoor pools using stabilized chlorine).
- Record all test results in the daily operation log.

**Testing Tip:** Test more frequently during periods of heavy use, hot weather, rain events, or when you observe any change in water clarity or odor. When in doubt, test again.

## Conversions, Formulas and Constants

Pool operators use these conversions and formulas regularly for chemical dosing, equipment sizing, and water volume calculations. Keep this page bookmarked for quick reference.

### Unit Conversions

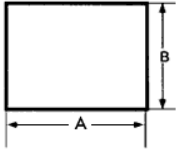
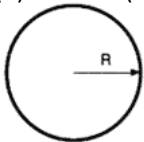
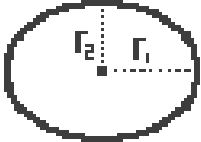
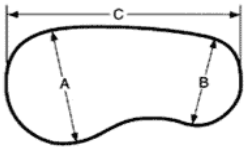
Conversion	Formula
Ounces to pounds (dry weights)	# oz ÷ 16 = # lbs
Square inches to square feet	# sq. in. ÷ 144 = # sq. ft.
Celsius to Fahrenheit	°F = (9/5 × °C) + 32
Fahrenheit to Celsius	°C = 5/9 × (°F – 32)
Fluid ounces to gallons (liquid weights)	# fl. oz. ÷ 128 = # gallons
Meters to feet	# meters × 3.28 = # feet
Liters to gallons	# liters × 0.264 = # gallons
Gallons to liters	# gallons × 3.785 = # liters
Parts per million (ppm)	1 ppm = 1 mg per liter = 8.34 lbs per million gallons

Unit	Teaspoon	Tablespoon	Fl. Oz	Cup	Pints	Quarts	mL	Liters
1 teaspoon	1	1/3	1/6	1/48	1/96	1/192	4.9	0.005
1 tablespoon	3	1	1/2	1/16	1/32	1/64	15	0.015
1 fluid ounce	6	2	1	1/8	1/16	1/32	30	0.030
1 cup	48	16	8	1	1/2	1/4	237	0.237
1 liquid pint	96	32	16	2	1	1/2	473	0.473
1 liquid	192	64	32	4	2	1	946	0.946
1 liter	203	67.6	33.8	4.23	2.11	1.06	1000	1
1 US gallon	768	256	128	16	8	4	3784	3.79

### Chemical Dosing Constants

Constant	Value
Weight of water per gallon	8.34 lbs
Cubic feet per gallon	7.48 gallons per cubic foot (usually rounded to 7.5)
Breakpoint ratio	10:1 (10 times the amount of chlorine to 'burn' out the combined chlorine amount) <b>Note:</b> can be 20-50 times higher if high CYA is present

## Pool Surface Area and Volume Calculations

Shape	Surface Area	Volume (in gallons)
Rectangular or square pools	Length (A) X width (B) = square feet 	Surface area X avg. depth X 7.5 = pool volume
Round	3.14 X radius (R) X radius (R) = square feet 	
Oval	3.14 X radius(r1) X radius(r2) = square feet 	
Kidney shaped	(A+B) X length(C) X .45 = square feet 	
Irregular shaped pools	Divide the pool up into basic shapes to best determine surface areas and volumes; then add together to get the total; or get a copy of the pool engineering specifications	
<b>NOTE: {Depth of shallow end + depth of deep end} ÷ 2 = Average Depth</b> <b>If circular: Radius is ½ the Diameter</b>		

## Flow Rate and Turnover

Turnover time is the number of hours it takes to circulate the entire pool volume through the filtration system one time.

**Flow Rate:** Pool volume ÷ Turnover Rate ÷ 60 = gallons per minute (gpm)

**Turnover Rate:** Pool volume ÷ Flow Rate ÷ 60 = hours

Venue Type	Maximum Turnover Time (AR Regs)
Swimming pools	6 hours
Wading & Therapy pools, Slides	2 hours (4 hrs if built before 2003 unless remodeled)
Spas and hot tubs	30 minutes (0.5 hrs if you put into the formulas)
Splash pads (recirculated)/special purpose	Case-by-case basis

**Worked Example — Flow Rate:**

A 153,562-gallon swimming pool requires a 6-hour turnover. What should the Flowmeter read?

Answer: 153,562 ÷ 6) ÷ 60 = 426.6 GPM

## Other Useful Formulas:

### Spa Water Change:

$$\text{Replacement Interval (days)} = \left[ \frac{\text{Spa gallons}}{3} \div \text{Users per day} \right]$$

Example: 800-gallon spa with 10 users per day. How many days until the water needs to be changed?

$$800/3 = 266.67 \rightarrow 266.67/10 = 26.67 \text{ round } 27.$$

So, every 27 days, replace the water

### Combined Chlorine (chloramines):

Total chlorine – Free Chlorine = if .2 or more, then breakpoint chlorinate

Example: You use your DPD test kit to test for free chlorine level 1.5 (DPD 1 test in kit) & Total Chlorine of 2.0 (DPD 3 test in kit). What is the Combined Chlorine level?

$$2.0 - 1.5 = .5 \text{ Combined Chlorine level—exceeds limit, and so you need to breakpoint chlorinate}$$

### Adjust Total Alkalinity with High Cyanuric:

$$\text{Alkalinity (ppm)} - \left\{ \frac{\text{CYA (ppm)}}{3} \right\} = \text{Adjusted actual Alkalinity}$$

Example: With your DPD test kit you measure Alkalinity at 60ppm and cyanuric at 90ppm.

What's the true alkalinity?

$$60 - (90 \div 3) = 30\text{ppm (actual alkalinity reading out of the acceptable range)}$$

**WARNING:** Do NOT use this formula solely to determine your target alkalinity dose. If this calculation shows your adjusted alkalinity is low due to high CYA (e.g., above 50 ppm), the primary solution is to lower CYA through dilution, not to add massive amounts of alkalinity. Drain, dilute, and retest.

### Bather Load (per Arkansas Swimming Max Bather Load (SPMBL) regulations):

$$\{(A - S) \div 30\} + \{S \div 15\} = \text{SPMBL (For outdoor pools)} \quad A = \text{Total area of water surface in square feet.}$$

$$\{(A - S) \div 30\} + \{S \div 25\} = \text{SPMBL (For indoor pools)} \quad S = \text{Surface Area of pool } < 5.5 \text{ feet depth in ft}^2.$$

Spa: max. bather load = 1 per 10 sq. ft. of water surface

Splashpads and special-purpose pools are determined on a case-by-case basis.

**Example:** Calculate the bather load for an Arkansas outdoor pool that is 40 ft wide by 65 ft long. It has a diving portion that is 25 ft long by 40 ft wide.



Surface Area of whole pool is  $(40 \times 65) = 2600 \text{ sq ft}$

Surface Area of just part is  $(25 \times 40) = 1000 \text{ sq ft}$

Surface Area of shallow (<5.5ft deep)  $\rightarrow (40 \times 40) = 1600 \text{ sq ft}$

Formula:  $\{(A - S) \div 30\} + \{S \div 15\} = \text{SPMBL (outdoor pools)}$

$$((2600 - 1600) \div 30) + (1600 \div 15) =$$

$$(33.3) + (106.6) = 139.9 \rightarrow \sim 140 \text{ Max Bather Load}$$

## Chemical Dosage Chart

The following charts shows the amount of each chemical product needed to treat 10,000 gallons of pool water.

**Scaling proportionally:** To calculate dosage for your pool volume:

(Your Pool Volume ÷ 10,000) × Chart Amount × (Adjustment ÷ ppm in chart) = Your Dosage

*Note: Adjustment (difference between end vs starting amounts)*

Decrease Chlorine (per 10,000 gallons):	
Chlorine Product	1 ppm
Sodium Thiosulfate	2.6 oz.
Sodium Sulfite	2.4 oz

Increase Free Available Chlorine (per 10,000 gallons):	
Chlorine Product	1 ppm
Chlorine gas (100%)	1.3 oz
Trichlor (90%)	1.5 oz
Dichlor (62%)	2.1 oz
Dichlor (56%)	2.4 oz
Calcium hypochlorite (67%)	2 oz
Sodium hypochlorite (12%)	10.7 fl. oz
Lithium hypochlorite (35%)	3.8 oz

Other Common Adjustments (per 10,000 gallons):	
Chemical Change	10 ppm
Increase Alkalinity with Soda Ash	14 oz
Increase Alkalinity with Sodium Bicarbonate	22.4 oz
Increase Alkalinity with Sodium Sesquicarbonate	20 oz
Decrease total alkalinity with Muriatic Acid (31.45%)	26 fl. oz
Increase calcium hardness with Calcium Chloride (100%)	14.4 oz
Increase calcium hardness with Calcium Chloride (77%)	19.2 oz
Increase Cyanuric Acid	13 oz

**Dosing Tips:** Always add chemicals in small amounts, circulate, re-test, and adjust. It is much easier to add more chemicals than to correct an overdose. Pre-dissolve granular chemicals in a bucket of water before broadcasting across the pool surface. **Always adjust Alkalinity first if out of range.**

**Example 1:** You have a 60,000-gallon pool with no free chlorine residual. You want to raise it to 5 ppm, and you are using calcium hypochlorite (cal hypo).

From the chart above: 2 oz of cal hypo changes 10,000 gallons exactly 1ppm

**Scaling Formula:** (Pool Volume ÷ 10,000) × Chart Amount × (Adjustment ÷ ppm in chart) = Your Dosage

1.  $60,000 \text{ gal} \div 10,000 \text{ gal} = \underline{6}$
2.  $\underline{2} \text{ oz} = \text{Chart Amount}$
3. (started with 0 ppm & wanting to raise it to 5ppm chlorine==meaning 5ppm Adjustment) ÷ ppm ----->  
 $5 \div 1 \text{ ppm} = \underline{5}$
4. Put into formula:  $6 \times 2 \text{ oz} \times 5 = 60 \text{ oz}$  raises chlorine to 5ppm in your pool or  $60 \text{ oz} \div 16 = 3.75 \text{ lbs}$

**Example 2:** Alkalinity reads 50 ppm. Pool is 25,000 gallons. Need 110 ppm (+50) using Sodium Bicarb.

**Scaling Formula:** (Pool Volume ÷ 10,000) × Chart Amount × (Adjustment ÷ ppm in chart) = Your Dosage

1.  $25,000 \div 10,000 = \underline{2.5}$
2.  $\underline{22.4 \text{ oz}} = \text{Chart Amount}$
3. Started with 50ppm but end with 110ppm---->(60ppm Adjustment ÷ 10ppm =  $\underline{6}$ )
4. Scale formula:  $2.5 \times 22.4 \times 6 = 336 \text{ oz}$  ( $336/16$ ) = 21 lbs of sodium bicarbonate to add to pool
5. Add slowly, in a slurry around the pool edge with pump running. Retest after 6 hrs of circulation.

## Breakpoint Chlorination

Breakpoint Chlorination (old term-*shocking*) is the process of raising the free chlorine level high enough to destroy combined chlorine (chloramines), organic contaminants, and algae. To reach the breakpoint, the formula uses a ratio of 10 parts free chlorine to 1-part combined chlorine is needed.\*

**\*Note:** The 10:1 ratio assumes CYA < 30 ppm. Research suggests that higher CYA requires larger doses. CYA at 50 ppm, the effective free chlorine concentration is roughly half that of a non-stabilized pool, so treatment time would approximately double. Consult current PHTA/CMAHC for more guidance.

### When to Breakpoint Chlorinate

- When combined chlorine (CC) exceeds 0.2 ppm, Breakpoint Chlorinate.  
Formula: *Total Chlorine – Free Chlorine = Combined Chlorine.*
- After a heavy bather load or a pool party/event.
- After a rainstorm or severe weather.
- When you detect a strong chlorine odor (this indicates chloramines, not excess chlorine).
- After a fecal or vomit incident (see Fecal Accident Response section).
- At seasonal opening after the pool has been closed.

### Breakpoint Chlorination Procedure

1. Close the pool to all bathers.
2. Calculate the chlorine dose needed (see Example).
3. Pre-dissolve granular shock (calcium hypochlorite recommended) product in a bucket of water.
4. Broadcast the dissolved mixture along pool edges, deep end, and across the pool surface.
5. Run the recirculation system continuously during treatment.
6. Re-test free chlorine before re-opening. Do not allow bathers to enter until free chlorine drops to below 5.0 ppm (or per manufacturer directions for the product used).

**Example:** Pool tests in a 25,000gal pool show: Total Chlorine = 3.2 ppm, Free Chlorine = 2.0 ppm.

1. Combined Chlorine (TC-FC) →  $3.2 - 2.0 = 1.2$  ppm combined chlorine
2. Breakpoint dose =  $1.2 \times 10 = 12$  ppm of free chlorine needed
3. Amount of chlorine to adjust:  $12 \text{ ppm} - 2 \text{ ppm} = 10 \text{ ppm}$  (There is already 2.0 ppm free chlorine in pool that you can use. So, you need to add 10 ppm of additional chlorine.
4. *Then use the Scaling formula to calculate the chlorine amount. You are using Cal-Hypo.*  
(The additional chlorine amount is your Adjustment value in the scaling formula.)

**Scaling Formula:**  $(\text{Pool Volume} \div 10,000) \times \text{Chart Amount} \times (\text{Adjustment} \div \text{ppm in chart}) = \text{Your Dosage}$

5.  $(25000 \div 10000) \times 2 \text{oz} \times (10 \div 1) = 50 \text{oz}$  or  $50 \div 16 = \underline{3.1 \text{ lbs of calcium hypochlorite}}$

**SAFETY:** NEVER add chemicals when swimmers are in the pool. If using a non-chlorine shock product (potassium monopersulfate), swimmers may be admitted within 20 minutes, per the manufacturer's directions. Non-chlorine shock is cost-effective for pools of 40,000 gallons or less.

**Best Practice:** Breakpoint Chlorinate at dusk or after closing. Sunlight rapidly degrades chlorine. Night shocking gives the chlorine maximum contact time without UV destruction.

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## Chemical Safety

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### **Chemical Handling and Safety**

Pool chemicals are hazardous materials. Improper handling can cause fires, explosions, toxic gas release, and serious injury. Always follow these rules:

- NEVER mix different pool chemicals together, even if they seem similar.
- NEVER add water to chemicals. Always add chemicals to water.
- Store oxidizers (chlorine products) and acids (muriatic acid, sodium bisulfate) in separate locations, physically divided so that a spill from one cannot contact the other.
- Keep all chemical containers tightly sealed, keep away from any moisture, and clearly labeled.
- Wear appropriate PPE: chemical splash goggles, chemical-resistant gloves, and a respirator when handling dry or gaseous chemicals.
- Keep a clean, dedicated scoop for each chemical. Never use the same scoop in different chemical containers.
- Pre-dissolve granular chemicals in a bucket of water before adding to the pool. This prevents bleaching of the pool surface and ensures even distribution.
- Never add chemicals directly over or near skimmers, drains, or bathers.

**CRITICAL SAFETY:** NEVER add chemicals when swimmers are in the pool. Close the pool during chemical treatment. If liquid chlorine contacts acid, deadly chlorine gas is produced instantly.

**SDS Requirement:** Safety Data Sheets (formerly MSDS) must be on-site and readily accessible for every chemical product used at the facility. Train all staff on SDS location and interpretation. Per OSHA, SDS must be available within the work area during every shift.

## First Aid Response

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Immediate first aid is necessary whenever anyone is exposed to chlorine or other pool chemicals. All pool operators and staff should be trained in CPR and first aid. Emergency phone numbers must be always posted and readily available.

### **Skin Contact**

- Remove contaminated clothing immediately.
- Flush affected skin with large amounts of clean water for at least 15–20 minutes.
- Do not apply ointments, salves, or other medications unless directed by medical personnel.
- Seek medical attention for chemical burns or persistent irritation.

### **Eye Contact**

- Immediately flush eyes with clean water for at least 15–20 minutes using the eyewash station.
- Hold eyelids open during flushing to ensure thorough rinsing.
- Do not rub eyes.
- Seek immediate medical attention.

### **Inhalation (Chlorine Gas or Chemical Fumes)**

- Move the affected person to fresh air immediately.
- If the person is not breathing, begin rescue breathing or CPR.
- Call 911 immediately for any significant inhalation exposure.
- Do not administer anything by mouth.

### **Ingestion**

- If a chemical has been swallowed, call Poison Control immediately: 1-800-222-1222.
- Do not induce vomiting unless specifically directed by Poison Control or medical personnel.
- If the person is conscious and able to swallow, have them rinse their mouth with water and sip small amounts of water or milk.

### **Recommended First Aid Kit Contents**

Maintain a stocked first aid kit in an accessible location near the pool. Recommended contents include:

- Adhesive bandages (assorted sizes)
- Sterile gauze pads and roller bandage
- Medical tape
- Antiseptic wipes and antibiotic ointment
- Cold pack (instant)
- CPR pocket mask or face shield
- Disposable gloves (non-latex recommended)
- Scissors and tweezers
- Blanket
- Eyewash solution (supplement to plumbed eyewash station)
- Emergency phone numbers card

## Disease and Accident Prevention

A routine, frequent disinfection program should be implemented to prevent disease and accidents. The following practices protect both the public and YOU as an operator:

- Always Maintain proper disinfection residual (refer to AR Chemical Parameters table). During heavy use, especially in hot weather when the temperature is above 84°F, or if you use a stabilizer, keep the chlorine residual at or above 1.5 ppm.
- Post diving board rules in the pool area and enforce them strictly.
- Maintain complete written records of daily water tests, chemical additions, accidents, and incidents.
- Enforce hygiene rules: require bathers to shower before entering the pool and to use the restroom before swimming.
- Restrict bathers with open wounds, skin infections, or gastrointestinal illness from entering the pool.
- Keep the deck area clean, dry (where practical), and free of trip hazards.
- Inspect the facility daily for safety hazards: loose tiles, broken drain covers, damaged ladders, missing signage.
- Ensure all safety equipment is in place and in good condition.

### **8 Most Common Recreational Water Illnesses — United States**

Ranked by CDC WBDOS outbreak surveillance (2000–2019), across treated venues (pools, hot tubs, splash pads)

#	Pathogen (Illness)	Type	Symptoms	How It Is Spread
1	<b>Cryptosporidium</b> <i>Cryptosporidiosis</i>	<b>Protozoan parasite</b>	Watery diarrhea, cramps, nausea, vomiting, dehydration. Lasts 1–2 weeks.	Swallowing fecally contaminated water. Oocysts survive 7–10+ days at 1ppm chlorine level
2	<b>Legionella pneumophila</b> <i>Legionnaires' disease;</i> <i>Pontiac fever</i>	<b>Bacterium</b>	Legionnaires': severe pneumonia, fever, cough, chills. Pontiac fever: milder flu-like, 2–5 days.	Inhaling aerosolized mist from hot tubs, spas, fountains. Not person-to-person; not from drinking.
3	<b>Pseudomonas aeruginosa</b> <i>Hot tub rash;</i> <i>swimmer's ear</i>	<b>Bacterium</b>	Itchy, pus-filled bumps under swimsuit area; or ear pain, itching, drainage.	Skin or ear contact with warm, poorly disinfected water. Forms biofilms on surfaces/plumbing.
4	<b>Norovirus</b> <i>Viral gastroenteritis</i>	<b>Virus</b>	Sudden vomiting, watery diarrhea, cramps, low fever. 1–3 days.	Swallowing water contaminated by feces or vomit. Very low infectious dose (10–100 particles).
5	<b>Shiga toxin–producing E. coli (STEC)</b> <i>E. coli O157:H7, O111</i>	<b>Bacterium</b>	Severe cramps, bloody diarrhea, vomiting. HUS (kidney failure) in 5–15%, especially children.	Swallowing water contaminated by human or livestock feces.
6	<b>Shigella</b> <i>Shigellosis</i>	<b>Bacterium</b>	Bloody or mucoid diarrhea, fever, stomach pain, painful straining. 5–7 days.	Swallowing fecally contaminated water. Very low infectious dose (10–100 organisms).
7	<b>Giardia duodenalis</b> <i>Giardiasis</i>	<b>Protozoan parasite</b>	Greasy, foul-smelling diarrhea, gas, bloating, cramps, weight loss. 2–6+ weeks.	Swallowing water contaminated by human or wildlife feces. Moderately chlorine tolerant.
8	<b>Naegleria fowleri</b> <i>Primary amebic meningoencephalitis</i>	<b>Amoeba</b>	Severe headache, fever, stiff neck, confusion, seizures, coma. ~97% fatal.	Water forced up the nose in warm (>80°F) freshwater. Not from drinking; not person-to-person.

## Naegleria fowleri and Amoeba Safety in Arkansas

*Naegleria fowleri* is a thermophilic (heat-loving) free-living amoeba found in warm freshwater environments. When water containing the amoeba enters the nose, it can travel to the brain and cause primary amebic meningoencephalitis (PAM), a rare but almost always fatal infection.

### **The 2023 Arkansas Case**

In September 2023, a fatal case of PAM was confirmed in Pulaski County, Arkansas, associated with a splash pad facility. This case was published in the CDC MMWR in 2025 and highlights the critical importance of proper water treatment across all aquatic venues, particularly in warm water recirculating systems.

**CDC MMWR Publication:** The Arkansas Department of Health published the findings of this case in the CDC Morbidity and Mortality Weekly Report (MMWR), March 2025. This case underscores the need for strict chemical maintenance in splash pads and warm-water features.

### **Risk Factors for Pool Operators**

- *Naegleria* thrives in warm water (77°F–115°F) with optimal growth above 95°F (35°C).
- The amoeba is killed by chlorine at proper levels. Maintaining free chlorine at or above 1.0 ppm (pools) or 2.0 ppm (spas) per AR regulations provides protection. Maintain lower CYA levels.
- While 1.0 ppm kills free-floating *Naegleria fowleri*, it natively breeds inside biofilms within piping and holding tanks. Routine chemical residuals cannot penetrate established biofilm. *Physical brushing and scrubbing of the holding tank, use of biofilm-stripping enzymes or hyperchlorination is recommended.*
- Splash pads with warm recirculated water are at elevated risk if chlorine drops below required levels.
- Warm water holding tanks, dead legs in piping, debris, and stagnant plumbing can harbor the amoeba.
- Risk increases during hot summer months (July–September) when water temperatures peak.

### **Prevention Measures**

- Always maintain proper free chlorine residual. Do not allow chlorine to drop below the minimum.
- Monitor water temperature. Higher temperatures require more vigilant chemical maintenance.
- Eliminate dead legs and stagnant water in the recirculation system.
- Flush piping systems regularly, especially after periods of non-use.
- Consider secondary disinfection (UV) for all warm water recirculated features.
- Test water chemistry more frequently during hot weather.
- Ensure the holding tank and all piping are accessible for cleaning and inspection.
- *Naegleria* naturally lives in soil and water environments. Prevent or ensure that any organic/natural debris from the surrounding environment does not enter the pool, spa, or splashpad.
- *Examples: no landscaping or planters near pool water; deck drains installed, clean, and working; pool surge tanks and splashpad holding tanks that are open to the outside elements or drain intrusion.*

**CRITICAL:** *Naegleria fowleri* infection is almost always fatal. Prevention is the ONLY effective strategy. Maintaining proper chlorine levels is the single most important protective measure.

## Fecal Accident Response Procedures

**IMPORTANT:** In the event of fecal contamination, the following procedures must be followed. These procedures are based on CDC and MAHC guidance. These procedures apply to all pools that share the same filtration system. If multiple pools share a filter, all connected pools must be closed and treated.

### For Both Formed-Stool and Diarrheal Accidents

- Direct everyone to leave all pools into which water containing the feces is circulated.
- Do not allow anyone to enter the contaminated pool(s) until all decontamination procedures are completed.
- Remove as much fecal matter as possible using a net or scoop. Do NOT use the pool vacuum for this step.
- Dispose of the fecal matter in a sanitary manner (toilet, not trash).
- Clean and disinfect the net or scoop used.

### Formed-Stool Response\*

- Formed stool is a lower risk because the pathogens are mostly contained within the stool mass.
- After removing the stool, raise the free chlorine level to at least 2.0 ppm (confirmed with DPD test).
- Ensure pH is 7.5 or lower.
- Maintain this level for approximately 30 minutes with the filtration system running.
- Confirm free chlorine is at the proper operating level before reopening.

### Diarrheal-Stool Response\*

- Diarrheal stool presents a much higher risk because it can possibly contain *Cryptosporidium* and other pathogens that are resistant to normal chlorine levels.
- After removing as much matter as possible, raise the free chlorine to 20 ppm.
- Ensure pH is 7.5 or lower (this is critical for effectiveness).
- Maintain 20 ppm free chlorine for at least 12.75 hours.
- During the entire treatment period, the filtration system must run continuously.
- Backwash the filter thoroughly after treatment.
- Confirm free chlorine has dropped to the normal operating range before reopening.

**Cryptosporidium:** Crypto is resistant to chlorine. A normal chlorine level will NOT kill Crypto. An infected person can contaminate a pool for days even after symptoms disappear.

**\*Special Note:** The Cyanuric Acid (stabilizer) level should be less than 50ppm in the pool. Higher CYA levels will slow down the chlorine's killing power. CYA at 50 ppm, the effective free chlorine concentration is roughly half that of a non-stabilized pool, so treatment time should approximately double. Consult the current PHTA/CMAHC for more guidance.

## Body Fluid Cleanup on Surfaces

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- Body fluids, including blood, feces, and vomit, on the pool deck are considered potentially contaminated. Clean up and disinfect contaminated surfaces immediately.
- Put on disposable gloves and any other appropriate PPE.
- Remove visible matter with disposable towels or absorbent material.
- Prepare a bleach disinfection solution: 1 tablespoon of household bleach (5.25–8.25% sodium hypochlorite) per 1 quart of water. Make this solution fresh each time.
- Apply the bleach solution to the contaminated area and allow at least 10 mins of contact time.
- Wipe the area with clean, damp cloths.
- Dispose of all contaminated materials in a sealed plastic bag and place in the trash.
- Wash hands thoroughly with soap and water after removing gloves.

## Emergency Action Plans

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Every commercial aquatic facility should have a written Emergency Action Plan (EAP) that covers foreseeable emergencies. Staff should be trained on the EAP, and drills should be conducted regularly. Post the EAP in the equipment room and office where staff can reference it quickly. It is highly recommended to have an EAP in place at your facility.

### **EAP Components**

- Facility addresses and directions for emergency responders (post prominently).
- Emergency phone numbers: 911, Poison Control (1-800-222-1222), facility owner/manager.
- Drowning/submersion response procedure.
- Spinal injury response procedure.
- Chemical exposure/spill response procedure.
- Severe weather (lightning, tornado) procedure.
- Fecal/vomit incident response procedure (see Fecal Accident Response section).
- Power outage procedure.
- Fire/evacuation procedure.
- Missing person (especially child) procedure.

### **Staff Training**

- Review the EAP with all staff at the beginning of each season.
- Document & Conduct at least one emergency drill per month during the operating season.
- Ensure all staff know the location of safety equipment, first aid kit, AED (if equipped), and emergency phone.

## When to Close a Pool

In compliance with Act 623 of 1987, as amended, and the Arkansas Rules and Regulations Pertaining to Swimming Pools and Other Related Facilities, the following critical items are grounds for immediate closure by the Department. The pool operator should voluntarily close the pool if any of these conditions exist:

- Failure to restrict employees/patrons with an infection
- Unapproved water supply without hot and cold running water under pressure
- Improper sewage or liquid waste disposal
- No approved disinfection system or disinfection system not operational (no handfeeding allowed)
- Free chlorine below 1.0 ppm (pools) or below 2.0 ppm (spas)—Bromine below 2.25 ppm
- Free chlorine above 5.0 ppm—Bromine above 4 ppm in pools and above 5 ppm in spas
- pH below 7.0 or above 7.8
- Water clarity: main drain not visible from the pool deck
- Missing, broken, unbolted, or non-compliant main drain covers
- Electrical hazard in or around the pool
- Power outages
- Drowning
- Lack of required supervision (Lifeguards)
- No access to emergency phone/EMS communications
- Fecal accident (until decontamination procedures are completed)
- Structural hazard: cracked pool shell, sharp edges, loose coping or tile
- Missing, improper or non-functional safety equipment (ring buoy, reaching pole)
- No barriers or gates to prevent unauthorized access
- Imminent weather threat (lightning within 10 miles, tornado warning)
- Flooding occurs
- Salt Cell malfunctions and there is no tablet feeder plumbed in and ready to go
- Flow meter is reading too low or too high from the acceptable operating range
- Vacuum port is not physically blocked (ex. threaded nut, rubber bunge w/nut, spring-loaded door)
- No Lifeline present (when pool is deeper than 5.5 ft deep, not counting specialized swim venues)

**Lightning Safety:** Close the pool and clear the deck immediately when lightning is observed, or thunder is heard. Wait at least 30 minutes after the last observed lightning or thunder before reopening. This is the 30/30 rule.

**Voluntary Closure:** Operators who voluntarily close and correct deficiencies before inspection demonstrate professionalism and reduce the risk of formal enforcement action. Document your closure and corrective actions.

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## Equipment Maintenance

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### **When to Backwash**

1. Follow the manufacturer's instructions for your specific filter.
2. If instructions are not available, backwash when the pressure gauge reaches 10–12 psi above the initial startup (clean) pressure reading.
3. Record the clean starting pressure for each filter unit at the beginning of the season.
4. Frequent backwashing is not necessary and wastes water. Backwash only when needed.

### **Backwash Procedure (Sand/DE Filters)**

1. Turn off the pump.
2. Set the multiport valve (or backwash valve) to the BACKWASH position.
3. Turn the pump back on.
4. Backwash until the sight glass (if equipped) runs clear, or for 2–3 minutes.
5. Turn off the pump.
6. Set the valve to RINSE. Run for 30–60 seconds.
7. Turn off the pump. Return the valve to the FILTER position.
8. For DE filters: Add the correct amount of DE through the skimmer to re-coat the grids.
9. Turn the pump on and resume normal filtration.
10. Record the date, duration, and post-backwash pressure in the daily log.

### **Spa and Hot Tub Cleaning Procedures**

Spas and hot tubs should be drained and cleaned periodically due to the buildup of minerals, oils, and other substances. Frequency depends on bather load and water quality, but water should be completely replaced at least every 30 days in commercial spas.

#### **Draining and Cleaning:**

1. Turn off the power to the spa.
2. Drain the spa completely.
3. Clean all surfaces with a spa-specific cleaner. Scrub the shell, jet fittings, and waterline.
4. Flush the plumbing with a pipe cleaner/biofilm remover before draining (add the product while the jets are running, then drain).
5. Rinse thoroughly with clean water.
6. Clean or replace the filter cartridge.
7. Refill with fresh water from an approved potable source.
8. Balance water chemistry before allowing bathers to enter.

**Spa Water Replacement Formula:** Spa Volume (gallons) ÷ 3 ÷ Average Daily Bathers = Days between water changes. **Example:** 400 gal spa ÷ 3 ÷ 10 bathers/day = 13 days between changes.

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## Secondary Disinfection Systems

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Secondary disinfection refers to treatment technologies used in addition to the primary chemical sanitizer (chlorine or bromine). These systems can destroy chlorine-resistant pathogens, reduce chloramine formation, and improve overall water quality. Secondary disinfection can reduce amount of sanitizer used as well. The MAHC recommends secondary disinfection for increased-risk venues (spas, spray pads, therapy pools, wading pools).

### **Ultraviolet (UV) Light**

UV systems expose water to ultraviolet light as it passes through a chamber installed on the recirculation piping after the filter and before chemical injection. UV light (specifically UV-C at 254 nanometers) damages the DNA of microorganisms, rendering them unable to reproduce or live for very long.

- Effective against Cryptosporidium, Giardia, and other chlorine-resistant pathogens.
- Does not produce chemical byproducts or change water chemistry.
- Does not provide a lasting residual. Primary sanitizer (chlorine/bromine) is still required.
- Requires annual lamp replacement and periodic quartz sleeve cleaning.

### **Ozone**

Ozone (O<sub>3</sub>) is a powerful oxidizer generated on-site by either corona discharge or UV ozone generation. Ozone oxidizes organic contaminants, destroys chloramines, and inactivates pathogens. After treatment, ozone must be removed from the water before it returns to the pool (via a contact chamber and off-gas destruction system) because ozone is toxic to bathers at high concentrations.

- Extremely effective oxidizer. Destroys chloramines and organic waste.
- Reduces the workload on the primary sanitizer.
- Does not provide a lasting residual in the pool water. Primary sanitizer (Cl/Br) is still required.
- Higher initial cost and more complex installation than UV.
- Requires a properly designed contact chamber and destruct unit.

### **Advanced Oxidation Process (AOP)**

AOP systems combine UV light with ozone or hydrogen peroxide to generate hydroxyl radicals, the most powerful oxidizers available for water treatment. Hydroxyl radicals destroy virtually all organic contaminants, chloramines, and pathogens on contact.

- Highest level of supplemental treatment available.
- Significantly reduces chloramine levels, disinfection byproducts, and chloramine off-gassing, which improves air quality in indoor facilities.

**Operator Tip:** Secondary disinfection does NOT replace primary chlorine or bromine. It supplements the primary sanitizer. Always maintain your required free chlorine or bromine residual regardless of secondary systems in use.

## Salt Chlorine Generators

Salt chlorine generators (SCGs), also called saltwater chlorinators, produce chlorine on-site by passing an electrical current through a cell containing mildly salted pool water. The electrolysis converts dissolved sodium chloride (salt) into sodium hypochlorite (liquid chlorine), which then sanitizes the pool water. A typical salt concentration of 2,500–4,000 ppm (varies by manufacturer) must be maintained in the pool water for SCGs to work properly.

**Salt Level:** 3,000 ppm of salt is barely detectable by taste. Ocean water is approximately 35,000 ppm. Pool-grade salt (99%+ pure sodium chloride) should be used. Never use rock salt, ice melt salt, or salt with anti-caking agents.

### Advantages

- Consistent, automatic chlorine production reduces manual chemical handling.
- Eliminates the need to store and handle chlorine products on-site (reduces chemical safety risk).
- Generally, produces softer-feeling water that is less irritating to the eyes and skin.
- Lower long-term chemical costs after initial equipment investment.

### Disadvantages and Other Considerations

- The cell must be inspected regularly and cleaned of calcium scale buildup (per manufacturer schedule, typically every 3–6 months).
- Salt generators cause a rise in pH. Operators will need to add an acid more frequently.
- Salt is corrosive to some metals and stone. Ensure all pool materials are salt-compatible.
- The cell has a finite lifespan (typically 3–7 years, depending on use and maintenance).
- SCGs produce unstabilized chlorine. Outdoor pools will still need cyanuric acid (CYA) added separately to help keep the chlorine residual level in the pool longer.
- During heavy bather loads or extreme heat, the generator may not produce enough chlorine to meet demand, especially in commercial/public pools. Manual supplementation may be needed.
- You must test the salt level on a regular basis to maintain proper concentration.
- A tablet feeder is required to be plumbed in and ready to be used if the salt cell fails to maintain a residual.

**AR Compliance for public & commercial pools:** Salt chlorine generators are acceptable in Arkansas as a primary disinfection method, provided the free chlorine residual always meets AR regulatory requirements. A tablet feeder must be plumbed in and ready for use if the residual falls below acceptable levels.

## Automation and Chemical Controllers

Modern chemical controllers and automation systems continuously monitor water chemistry and automatically adjust chemical feed rates. While they significantly improve consistency and reduce operator workload, they do not eliminate the need for manual testing and oversight.

### Types of Controllers

System Type	What It Monitors	What It Controls
<b>ORP/pH Controller</b>	Oxidation-reduction potential (mV) and pH	Chlorine or bromine feed rate; acid feed rate
<b>Amperometric Controller</b>	Free chlorine concentration directly	Chlorine feed rate
<b>Colorimetric Analyzer</b>	Free chlorine and pH via reagent-based testing	Chlorine and acid feed rates
<b>Pool Automation Hub</b>	ORP, pH, temperature, flow, filter pressure	Chemical feeds, pumps, heater, lighting, covers

### Operator Responsibilities with Automation

- Controllers require regular cleaning and calibration per manufacturer schedule (typically weekly or bi-weekly for ORP and pH sensors).
- Manual DPD testing must still be performed at least once daily to verify the controller's readings.
- Chemical feed pumps, tubing, and injection points must be inspected regularly for clogs, leaks, and wear.
- Maintain a backup supply of manual chemical dosing equipment in case of controller failure.
- Document all calibrations, manual test comparisons, and controller maintenance in your daily log.

**Critical:** NEVER rely solely on a chemical controller without manual verification. Controller sensors drift, foul, and fail. A malfunctioning controller can overfeed or underfeed chemicals, creating dangerous conditions for bathers. DPD testing is still required by operator each day to maintain compliance.

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## Splash Pads and Interactive Water Features

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Splash pads (also called spray grounds, spray parks, or interactive water play features) are aquatic venues where water is sprayed, jetted, or cascaded over users without a standing body of water. They are increasingly popular in municipal parks, hotels, and recreational facilities.

### **Regulatory Status in Arkansas**

Splash pads with recirculated water systems are regulated as swimming pools under the Arkansas Rules and Regulations. The water must be treated, filtered, and maintained to the same chemical standards as any other pool. Non-recirculated (flow-through) systems, where water goes directly to the sanitary sewer without being reused, have different requirements; consult your local EHS.

### **Key Operational Requirements**

- Recirculated systems must maintain free chlorine, pH, alkalinity, and other parameters per the AR Chemical Parameters table.
- Turnover time for recirculated spray features is on a case-by-case basis.
- Secondary disinfection (UV or ozone) is strongly recommended by the MAHC for all interactive water play features due to the high risk of fecal contamination from young children.
- Filters should be high-rate sand or other media capable of handling the heavy organic and particulate load.
- The holding tank/reservoir must be accessible for cleaning (debris removal, etc.) and inspection.
- Spray nozzles, jets, and other play features must be inspected and cleaned regularly to prevent biofilm formation.
- Chlorine residual can lower quickly when being sprayed, and with heavy use on splashpads.

### **Special Risks**

- Young children (primary users) are the highest-risk group for fecal accidents and recreational water illness.
- Users often have face and nose contact with spray features, increasing ingestion and inhalation risk.
- Warm water in holding tanks and piping can support the growth of *Legionella* and *Naegleria fowleri* if not properly treated.
- No standing water means no visual indicator of water quality (clarity is not assessable the same way as in a pool).
- *Naegleria* can thrive in biofilms, in debris layers, and in sediments in holding tanks. Routine cleaning and breakpoint chlorination are highly recommended on a regular basis.

**Naegleria Risk:** The 2023 Arkansas fatal case of *Naegleria fowleri* PAM was associated with a splash pad facility. Splash pads with warm, recirculated water that is not properly maintained are HIGH RISK for amoeba growth. See the *Naegleria fowleri* section for details.

## Troubleshooting and Preventive Maintenance

Use this reference table to diagnose common pool and spa problems and determine corrective actions. When in doubt, contact your local Environmental Health Specialist or a qualified pool service professional.

Area	Problem	Preventive or Corrective Action
<b>Hydraulics</b>	Pool flotation or movement, cracking on the sides or bottom	Do not drain the pool when the subsurface water table is high due to continuous rains, low terrain, or a missing/ineffective hydrostatic valve in the main drain.
	Constant low water level in the balance tank	Check for leaks in piping, shell, or fittings. Consider float-controlled valves for automatic water makeup.
	Howling sound from the pump (cavitation)	Increase head pressure by throttling back the valve following the pump. Check for blockage on the suction side and for air leaks.
<b>Electrical</b>	Continued power short-circuiting	Disconnect or trip breaker to off. Call a qualified service technician.
	Can feel electrical current but no shock	Cords on deck lying in water can discharge low currents. String cord above deck. Check bonding/grounding on all metal components and equipment.
	Sparks or smoke	Turn off immediately. Call a qualified service technician.
	Hot, growling, or vibrating motor	Bearings need lubrication or replacing. Coupling connection out of balance. Stop motor immediately.
<b>Mechanical</b>	Lights dim	Determine what equipment causes the change. Check voltage demand. Check for short circuiting of appliances.
	Valves turn hard	Lubricate stem.
	Excessive water leaking from valve	Tighten packing nuts. Replace packing.
	Pump is not moving water	Prime pump. Clean skimmer or hair and lint screen. Check impeller. Check pump rotation direction. Check for obstruction at inlets. Check suction-side fittings for air leaks causing cavitation. Check all valve settings.
<b>Temperature</b>	Excessive leaking at pump	Tighten packing. Replace packing if tightened to maximum. Replace shaft seal. Tighten any disconnect unions.
	Changes in pool temperature	Check heater thermostat. Check heater efficiency and operation. Filter and/or pump operation may be inadequate.
	Indoor air during extreme weather	Reduce or eliminate air exhaust. Check humidistat. Screen windows to reduce heat loss.
	Cold showers	Check heater. Limit length of showers if demand exceeds supply.
	Warm pool water	Drain and add fresh cool water. Aerate. Check chiller if equipped.
<b>Humidity</b>	Scale formation on heater tubes	Excessive calcium hardness in pool water. Water flow through heater is restricted. Check for debris in skimmers, hair/lint strainer, and filters.
	Windows and walls water laden in pool area	Maintain air 2–3°F warmer than pool. Warm walls and structure to raise dew point. Introduce warm dry air. Increase air movement.
<b>Water Clarity</b>	Shower/locker rooms damp	Check exhaust system. Open windows for cross ventilation.
	Cloudy water during heavy loads	Increase chlorine to 3 ppm prior to load. Check filter efficiency. Check turnover rate. Test water every hour.
<b>Water Clarity</b>	Dull or gray for extended period	Breakpoint Chlorinate to 8–10 ppm. Check filter efficiency. Check TDS. Partially drain and refill pool.

<b>Flowmeter</b>	Reading too low or not moving	1) Filter clogged; backwashing may be necessary. 2) Skimmers, screens, strainers may need cleaning. 3) Flowmeter may be fouled or installed incorrectly. 4) Pump malfunction. 5) Incorrect flowmeter size or placement
	Reading too high	Pump may need throttled down (use valve setup or if variable speed pump, then change rpm setting). Incorrect placement or flowmeter size.
<b>Pool Shell</b>	Slippery sides and/or bottom	Breakpoint Chlorinate 8–10 ppm. Brush area to eliminate potential algae growth or biofilm.
	Stains around inlets	Adjust pH (likely too low and corrosive).
	Brown, blue, or black stains on plaster	Metals (iron, copper, manganese); low pH causing erosion of metal components. Add sequestering agent. May require drain and acid wash.
	Scaling on walls and pipes	Excessive calcium hardness or high pH. Lower pH. Partially drain and refill. Check calcium hardness level.
<b>ORP Controller</b>	ORP reading too low	Disinfection low, pH too high, or cyanuric acid too high. Sensor may be faulty, fouled, or out of calibration.
	ORP reading too high	Disinfectant too high, pH too low. Sensor may need cleaning or replacement.
<b>Pool Water</b>	Air bubbles in water	Check suction side of pump for air leaks at hair and lint strainer, pump lid O-ring, and all suction-side fittings.
	Green water	Algae growth. Shock, brush, and clean filter. Check and correct chlorine and pH levels. Add algaecide.

## Pool Finishes and Surface Care

Pool Finish Type	Description	Pros and Cons
<b>Rubber-Based Paint</b>	Chlorinated rubber base paint that provides a smooth, water-repellent surface.	Easy to apply; new coat bonds well to old coat. Requires repainting every 3–5 years.
<b>Epoxy Paint</b>	Two-part chemical-cure coating that provides a hard, durable, chemical-resistant surface.	Lasts 5–7 years. Excellent chemical resistance. More difficult to apply and requires careful surface preparation.
<b>Plaster (White Coat/Marcite)</b>	Portland cement and marble dust troweled directly on concrete shell.	Traditional finish for commercial pools. Lasts 7–15 years. Can be refinished. Surface becomes rougher with age.
<b>Pebble/Aggregate</b>	Small pebbles or quartz aggregate mixed with cement and applied like plaster.	Very durable (15–20 years). Textured surface provides traction. Higher cost than plaster.
<b>Tile</b>	Ceramic, porcelain, or glass tile installed over concrete shell.	Most durable and attractive option. Easy to clean. Highest cost. Requires skilled installation.
<b>Fiberglass</b>	Factory-molded shell or gel-coat applied over existing surface.	Smooth, stain-resistant surface. Gel-coat can blister over time and requires re-coating.
<b>Vinyl Liner</b>	Manufactured vinyl sheet custom-fit to the pool shell.	Smooth, non-abrasive surface. Liners last 7–12 years. Vulnerable to punctures, fading, and wrinkles.

### Surface Preparation for Painting

For new concrete: Allow at least 28 days for curing before painting. Acid-etch the surface to create a profile for paint adhesion.

For repainting: Clean all dirt, algae, and loose paint. If paint is peeling, blistering, or powdering badly, sandblast to bare concrete. Make sure to remove all old paint and have all cracks and air holes filled.

### Acid Etching Procedure

**SAFETY:** Always wear full protective gear when working with acid: gas mask/respirator, chemical-resistant rubber gloves and boots, splash goggles, and protective clothing.

1. Drain the pool completely. Open hydrostatic relief valves to prevent pool pop-up.
2. Never add water to acid. Always add acid to water.
3. Prepare a solution of 1-part muriatic acid (31.45%) to 3 parts water in a plastic container.
4. Wet the pool surface with a hose before applying the acid solution.
5. Apply the acid solution to a small area (approximately 50 square feet) at a time.
6. Scrub with a stiff-bristle brush. The surface should fizz when the acid contacts the concrete.
7. Rinse thoroughly with clean water before moving to the next section.
8. Neutralize rinse water before disposal (sodium bicarbonate can be used for neutralization).
9. Allow the surface to dry completely before painting.

# Appendix

## VGB Act

The Virginia Graeme Baker Pool and Spa Safety Act (VGB Act) is a federal law enacted in 2007 (effective June 2008) that requires all public pools and spas to have compliant drain covers and anti-entrapment systems. The law was enacted after the drowning death of Virginia Graeme Baker, who was trapped by the suction of a spa drain.

### Types of Entrapment

Entrapment Type	Description	Prevention
<b>Body entrapment</b>	Torso or limb held against the drain by suction	VGB-compliant covers rated for max flow; dual drains
<b>Hair entrapment</b>	Hair drawn into the drain opening and entangled	Domed or raised drain covers; dual drains
<b>Limb entrapment</b>	Finger, toe, or arm inserted into the drain opening	Covers with openings too small for fingers/toes
<b>Evisceration</b>	Body cavity positioned over flat drain creates seal	Domed/raised covers eliminate flat surface contact
<b>Mechanical entrapment</b>	Jewelry, swimsuit, or toy caught in drain opening	Proper cover design and sizing

#### **NOTE:**

**LIFE SAFETY:** A missing, broken, or non-compliant drain cover is grounds for IMMEDIATE pool closure. This is a life-safety issue with zero tolerance.

#### **Operator/Owner Responsibilities:**

VGB Requirements and Certifications should be reviewed with your insurance carrier and legal advisors. *VGB compliance is enforced and regulated by the Consumer Product Safety Commission. ADH does not inspect, certify, or enforce VGB requirements.*

## ADA Accessibility Requirements

The Americans with Disabilities Act (ADA) requires that public swimming pools and spas provide accessible means of entry for people with disabilities. The 2010 ADA Standards for Accessible Design, which took effect for pools in 2012, establish specific requirements.

#### **Operator/Owner Responsibilities:**

Refer to your insurance and legal counsel if you have questions about meeting ADA requirements. *It is a federal regulation enforced by the Department of Justice. The Arkansas Department of Health does not inspect, certify, or regulate ADA issues.*

**Pre-Opening Checklist (suggested)****STRUCTURAL**

- Pool floors and walls watertight; repairs or resurfacing done
- No visible dirt or algae; power wash stains
- Inlets in good working order; adjusted to prevent dead spots
- Main drain grated and secured (VGB covers)\*; hydrostatic valve checked
- Skimmers in good repair; weirs operational; baskets cleaned
- Hair and lint strainers in place; checked and cleaned
- Deck in good repair; properly drained; loose debris removed
- Fence min 4 ft, openings <4", gate self-closing/self-latching/lockable

**EQUIPMENT**

- Chlorinator good: no leaks, lines checked for brittleness
- Filter system good: no leaks, gauges work, media level checked
- Record clean startup pressure: \_\_\_\_\_ PSI
- Record and verify the flow meter reading is accurate: \_\_\_\_\_ gpm
- Pump runs smoothly; no leaks or unusual noise
- Flow meter working: readable, no cracks, plunger not fluttering
- Diving boards, ladders, handrails attached; non-slip steps; edges marked
- Lighting good: screws secure, leak-proof, GFCI for underwater lights
- Heater fires and heats properly (if applicable)

**SAFETY AND COMPLIANCE**

- Pool area fencing is a minimum of 4ft high; no openings more than 4 inches wide vertically or horizontally
- Gates are self-closing, self-latching, and lockable
- Warning signs posted in plain view; clearly visible; min 4" lettering
- Depth markers: required height, contrasting color, wall, and deck
- Life-saving equipment: good repair, visible & accessible (shepard's hook bolted or single piece, ring buoy)
- First aid kit provided and restocked
- Lifeline installed in pools >5½ ft deep
- DPD Test kit has new reagents; test strips not used
- Chemical rooms clean; free of water/leaks; current SDS accessible
- Required records and blank copies ready
- Indoor pool: proper ventilation; HVAC working
- Contact the local health unit 7–10 days before opening—it is required!
- Annual permit fee paid

**Winterization Closing Punch List (suggested)**

- Check the hydrostatic relief valve BEFORE lowering water
- Lower water 4–6" below skimmer; Don't drain pool entirely; groundwater pressure can crack/float shell
- Blow out all underground lines with an air compressor
- Drain heater, pumps, and filters completely and remove drain plugs
- Remove/store chemical feeders, strainer baskets, and equipment indoors
- Add algaecide and winterizing chemical
- Install ASTM-rated winter safety cover; secure anchors
- Turn off all electrical breakers
- Lock gates and chemical storage



**Example: Pool Inspection Form-code references**

**WATER QUALITY**

- 01. (SECTION VI.B2) Mandatory chemical parameters set forth in Appendix B
- 02. (SECTION VI.B2) Mandatory chemical parameters set forth in Appendix B
- 03. (SECTION VI.B2) Mandatory chemical parameters set forth in Appendix B
- 04. (SECTION VI.B1) Water must be sufficiently clear to plainly view the main drain(s) from pool deck at all times when the pool is open. Viewer must clearly distinguish the type, shape & number of main drain gratings when standing at edge of the pool deck nearest that main drain.
- 05. (SECTION VI.B2) Mandatory chemical parameters set forth in Appendix B
- 06. (SECTION XX.L9) The maximum water temperature for a spa or therapy/spa pool shall be 104° F and this temperature shall be posted at the spa in three (3) inch letters. A non-breakable thermometer shall be provided for use in the spa.
- 07. (SECTION VI.B2) Chemical parameters set forth in Appendix B

**OPERATION & MAINTANENCE**

- 08. (SECTION IV & SECTION XXII.D,E,H,I,K & SECTION XXIII) Compliance of public/commercial facility. Inspection of facility. Closure/abandonment; valid permit; critical item; chemical parameters; imminent health hazard; suspected waterborne outbreak; exceeding time limit for correction; abandoned pool covered, drained, secured.
- 09. (SECTION VI.A,C & SECTION VII) Water; meets Department standards; approved make-up water devices. All sewage waste has adequate and approved disposal
- 10. (SECTION XX.A, B & SECTION XXII.F,G) Supervisory personnel at facility; trained staff and/or lifeguards present. Bathers; bathers with open cuts, rash, skin lesion, disease/communicable disease prohibited; proper swim wear; disposable diapers prohibited.
- 11. (SECTION XVIII) Equipment room/pad; accessible, drained, ventilated, storage, lighting, safeguarded, clean.
- 12. (SECTION XVI) Adequate test kit provided. The use of OTO kits is prohibited. Other test kits/equipment may be required.
- 13. (SECTION XXII.C & SECTION VI.3,4) Operation records; kept, accessible, manual. Daily swimming pool operation records & Accident/Drowning reports are mandatory. Bacteriological quality. Testing intervals.
- 14. (SECTION VIII.A,B,G & SECTION XXII.B,J & SECTION XIX) Maintenance; facilities, equipment; floors free of cracks/defects. Floors/walls/ceilings/etc free of defects, clean & in good repair. Bather facilities/lockerooms/restrooms; provided as required; hot and cold running water, lighted, ventilated; clean, good repair. Lighting; number; arrangement.
- 15. (SECTION VIII.D & SECTION XVII & SECTION XXII.A & SECTION XXII.B) Walk areas; cleanable; no carpet; deck drains or well drained; crack free; appropriate width. Vac head/hose, wall brush, leaf net, telescoping pole provided. Fixtures, sides & bottom of Pool/Spa shell are clean; smooth & free of cracks/defects.
- 16. (SECTION VIII.C4, C5, D4 & SECTION XX.D3, D4, D5) Slides/spray & other features: proper water depths & distances; deck widths for features; proper barrier/access for attractions
- 17. (SECTION XX.C & SECTION VIII.D4,E) Deck width of 4ft (<3000 sqft of water surface) or 8ft (>3000 sqft of water surface) behind board; 13ft unobstructed headroom above board

**SAFETY**

- 18. (SECTION XX.C & SECTION J & SECTION XX.M) Any activity or condition at the facility that may cause injury or death.
- 19. (SECTION XX.D) Fences; unauthorized entry; surrounds all 4 sides, 4' high minimum with openings no more than 4" wide; self-latching/closing, lockable gates. Pool must be visible from the outside barrier. Water slide/attractions need separate fencing. Clubhouses/buildings that join the pool area must have door/gate criteria.
- 20. (SECTION XX.L1-5 & SECTION XXI & SECTION XX.D3 & SECTION XX.L10) Signage; legible, minimum 3" high lettering; no diving; no lifeguard on duty; spa warning. Bather load calculated & posted. Pool closure signs must be posted.
- 21. (SECTION XX.F and SECTION XX.G and SECTION XX.I) Facility has capability of reaching 911 dispatch. Any drowning/death or serious injuries must be reported within 72 hrs after occurrence. Basic first aid for minor injuries.
- 22. (SECTION XX.H1) Shepherd's crook, pole and ring buoy/rescue tube are adequate, in good repair, visible & readily accessible
- 23. (SECTION XX.L6-7) Depth markers have contrasting color of 3" lettering on deck, 2" on vertical pool wall, located at min & max water depths & slope changes & contour changes.
- 24. (SECTION VIII.I & SECTION XX.L8) All steps are non-slip & have handrails; ladders must be present on deep unless noted otherwise. Steps/benches must contrasting color marking on edges.
- 25. (SECTION XX.E) Chemical storage; original containers; used and stored as labeled.
- 26. (SECTION XX.C) Vacuum port (if present) should be blocked/plugged/property valved when not in use to prevent entrapment hazard.
- 27. (SECTION IX.H & SECTION XX.C) max of 30% flow through main drains & not to exceed grate rating, hydrostatic valve installed, anti-entrapment cover, dual drains are 3ft apart, spa/jet suction grates must meet same criteria as main drains. Main Drain covers should be present & in good repair & secure.
- 28. (SECTION XX.H2) Lifeline at 5'6" water depth, or separating shallow & deep depths; present and in good repair
- 29. (SECTION XX.K) Spa timer has max setting of 15mins; located far enough away for patron to exit spa to reset; emergency shut-off (on new or remodel) must be accessible and visible

**MECHANICAL**

- 30. (SECTION IX.B) Turnover rates  
 Swimming/Competition Pool.....Existing Construction: 8 hrs (pools built prior to 2003)  
 New Construction/Remodel: 6 hrs (unless otherwise noted on remodel review)  
 Wading Pool/Water Slide/Therapy.....2hrs  
 Spa.....30mins

<b>Minimum GPM needed</b> water volume ÷ (turnover rate x 60) If a spa then: spa volume÷30	<b>Maximum GPM not to exceed</b> Filter size (in sq ft) x filter media rate
Filter media rates ( in gal/sqft) are: sand 15 (7.5 for existing pools before 2003), D.E. 2.0, Cartridge 0.0375	

- 31. (SECTION XI) Filtration; NSF/ANSI approved; flow control device present (ball/gate valve, etc); gauges working; flow meter location & working; backwash adequate with sight glass & 6" air gap; filter media adequate and filter sized correctly
- 32. (SECTION XII & SECTION XIII) Disinfection; continuous; NSF/UL approved. Other chemical feeders adequate.
- 33. (SECTION IX.A,C,D,E,F,G,I,J & SECTION X) Recirculation; necessary equipment/ fixtures working & constructed properly; NSF/UL approved; flow indicators; skimmer weirs; flow adjustment valves; directional inlets. Gutters, surge pit, skimmers clean and in good repair.
- 34. (SECTION V & SECTION VIII & SECTION XV & SECTION XIV) Plan review/design; plans submitted with approved design/equipment. Heaters. Controlled limited-use spas.

## Swimming Pool and Spa Equipment Profile Sheet *(Suggested Form)*

(Equipment Inventory for Reference in Facility Files)

Name of Facility _____					
Physical Address _____					
Mailing Address _____					
Name of Owner _____	Phone Number _____				
Name of Designated Contact Person(s) _____ _____ _____	Phone Number _____ _____ _____	Certified Operator Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>			
Location Indoor <input type="checkbox"/> Outdoor <input type="checkbox"/>	Facility Setting Rehab <input type="checkbox"/> Municipal <input type="checkbox"/> Camps <input type="checkbox"/> Motel/Hotel <input type="checkbox"/> Country Club <input type="checkbox"/> Apartment/Condo/RV <input type="checkbox"/> Fitness Center/Gym <input type="checkbox"/> School/University <input type="checkbox"/> Government <input type="checkbox"/> Property Owners Assn. <input type="checkbox"/>	Type Pool <input type="checkbox"/> Spa <input type="checkbox"/> Spray <input type="checkbox"/> Feature <input type="checkbox"/> Wading <input type="checkbox"/> Therapy <input type="checkbox"/> Other <input type="checkbox"/>	Water Features Slide <input type="checkbox"/> Diving <input type="checkbox"/> Zero Entry <input type="checkbox"/> Play Feature <input type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/>		
<b>Equipment Data</b>					
Volume (in gallons) _____	Turnover rate (in hours) 8 hr <input type="checkbox"/> 6 hr <input type="checkbox"/> 2 hr <input type="checkbox"/> Other <input type="checkbox"/>	Min. Flow Rate _____	Max. Flow Rate _____	Bather Load _____	
Pump Manufacturer _____	Model # _____	Horsepower _____	Number of pumps _____		
Filter Manufacturer _____	Model # _____	Number of filters _____			
Square Feet of Each Filter _____	Type: Sand <input type="checkbox"/> Diatomaceous Earth <input type="checkbox"/> Cartridge <input type="checkbox"/>				
Disinfection Manufacturer _____	Type of Chemical or Feeder:	Salt <input type="checkbox"/>	Dichlor <input type="checkbox"/>	Cal hypo <input type="checkbox"/>	Lith <input type="checkbox"/>
Model # _____	Backup Option _____	Trichor <input type="checkbox"/>	Sodium hypo <input type="checkbox"/>	Gas <input type="checkbox"/>	
Secondary Disinfection: UV Light <input type="checkbox"/>		Ozone (Corona Discharge) <input type="checkbox"/>	Copper/Silver Ion <input type="checkbox"/>	None <input type="checkbox"/>	



**Record of Pool Contamination Incident (Required)**

Date of incident: \_\_\_\_\_ Time of incident: \_\_\_\_\_ am/pm

Name of individual responsible: \_\_\_\_\_

Home Address: \_\_\_\_\_ Male \_\_\_ Female \_\_\_

Did individual have symptoms of illness at time of incident? Yes \_\_\_ No \_\_\_

If yes, list symptoms: \_\_\_\_\_

Type of contamination: Formed Stool \_\_\_ Diarrheal \_\_\_ Vomit \_\_\_ Blood \_\_\_ Other \_\_\_

Decontamination procedures performed:

- Pool cleared of bathers
- Fecal matter removed with net/scoop
- Formed stool protocol followed (2 ppm / 30 min)
- Diarrheal protocol followed (20 ppm / 12.75 hrs at pH 7.5 or lower)
- Filter backwashed after treatment
- Free chlorine returned to operating range before reopening

Time pool closed: \_\_\_\_\_ Time pool reopened: \_\_\_\_\_

Reported to local health department? Yes \_\_\_ No \_\_\_

Operator Signature: \_\_\_\_\_ Date: \_\_\_\_\_

*Retain with permanent facility records.*

## Report of Accident or Drowning at Pools, Spas, or Other Related Facilities *(Required)*

### General Information

Name of Facility: \_\_\_\_\_ Address: \_\_\_\_\_ City: \_\_\_\_\_

Name of Victim: \_\_\_\_\_ Address: \_\_\_\_\_ City: \_\_\_\_\_

Date of Incident: \_\_\_\_\_ Time: \_\_\_\_\_ am/pm Accident \_\_\_ Drowning \_\_\_ Fatality \_\_\_

Description of water and weather conditions at time of incident: \_\_\_\_\_

Name of employees involved in rescue attempt or treatment: \_\_\_\_\_

Facility open at time of incident? Yes \_\_\_ No \_\_\_ Lifeguard on duty? Yes \_\_\_ No \_\_\_ Bather load: \_\_\_

### Victim Information

Male \_\_\_ Female \_\_\_ Age: \_\_\_ Non-swimmer? Yes \_\_\_ No \_\_\_

Activity at time of incident: Swimming \_\_\_ Diving \_\_\_ Wading \_\_\_ Sliding \_\_\_ On deck \_\_\_ Other: \_\_\_

Chemical or chemical-related accident? Yes \_\_\_ No \_\_\_ If yes, chemicals involved: \_\_\_\_\_

Brief description of accident: \_\_\_\_\_

Were police, rescue unit, or other emergency personnel called? Yes \_\_\_ No \_\_\_ If yes, list: \_\_\_\_\_

Brief description of emergency action taken on site: \_\_\_\_\_

Degree of treatment required: None \_\_\_ CPR \_\_\_ First Aid \_\_\_ Emergency Room \_\_\_ Hospital Admission \_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

### Employee SDS (Safety Data Sheet) Training Record *(Suggested Form)*

Facility Name: \_\_\_\_\_ Date: \_\_\_\_\_ Trainer: \_\_\_\_\_

Topics covered:

- Special handling procedures for swimming pool chemicals
- Storage practices for swimming pool chemicals
- Potential health-related hazards
- Swimming pool chemical interactions
- Common pool chemicals: sodium hypochlorite, calcium hypochlorite, bromine, muriatic acid, sodium bisulfate, sodium bicarbonate, test kit reagents
- General protection practices: eyes, face, hands, clothing, respiratory
- Emergency procedures for spills, exposure, and fire
- Location of SDS binder/digital access

Employee Signatures:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_

### **Signage Rules for Pool and Other Related Facilities (Suggested)**

These rules may be conveyed by any combination of words, pictures, or symbols.  
Those rules noted by \* are addressed within the Rules and Regulations.

#### **“Pool Rules Signage”**

1. All persons should take a shower before entering the water.
2. Running or boisterous play is not allowed on the deck.
3. \* Glass articles, sharp metal objects, and other hazardous objects are not allowed in the enclosure.
4. \* Pets or any animals are not allowed in the enclosure except for service animals for the physically impaired.
5. \* Persons with contagious or infectious health conditions are not permitted to patronize the pool.
6. Games, tubes, and other water play equipment can be allowed with permission of the management and if properly supervised.
7. \* An adult must accompany minors under the age of 12.
8. Children under the age of 7 shall require the presence of a parent or guardian. Non swimmers of any age must not enter the deep area.
- 9 \* Location of nearest telephone for emergency use or emergency notification procedure.
10. Pool hours are \_\_\_\_\_
11. \* A first aid kit is located to . (Set by owner and posted) .
12. \* Street clothes and shoes are not allowed in the water. Children should not be allowed in the pool or wading pool with disposable diapers unless covered with plastic pants.
13. \* Food or drink is prohibited in the pool water.
14. Gum and tobacco are not allowed on the wet deck area.
15. Use of the pool by persons under the influence of alcohol or drugs is prohibited.
16. The management has the right to ask any patron to leave for non-compliance with the above rules.

## **“Spa Warning Sign”**

Precautions for spa patrons shall be posted. The following language is recommended:

### **CAUTION**

1. Elderly persons and those suffering from heart disease, diabetes, or high blood pressure should consult a physician before using the spa pool.
2. No person suffering from a communicable disease, transmissible via water, shall use the spa pool.
3. Persons using prescription medications should consult a physician before using the spa pool.
4. Individuals under the influence of alcohol should not use the spa pool.
5. No person shall use the spa pool alone.
6. Pregnant women should not use the spa pool without consulting their physicians.
7. Persons should spend no more than 15 minutes in the spa at any one session.
8. All children under 14 years of age shall be accompanied by a responsible adult observer.
9. No person shall run or engage in horseplay in or around the spa pool.
10. Patrons should shower before and after using the spa pool.

**“No Diving”** This sign is required and shall be displayed in conspicuous locations at all pools not meeting the minimum requirements for diving i.e., less than 5 ½ feet deep. The sign shall read —NO DIVING|| with minimum three (3) inch lettering. —NO DIVING|| tiles placed conspicuously on the deck shall meet this requirement.

**“Warning – No Lifeguard On Duty”** This sign required and shall be posted at pools and other related facilities where lifeguard service is not required and not provided. The sign shall be in clearly legible letters at least three (3) inches high. The sign shall also state children should not use the pool without an adult in attendance.

## **“Water Slides Safety Signage”**

The following warnings must be posted at all slides:

1. Always slide feet first and only after previous slider has cleared the area.
2. No jumping or diving from slide.
3. Only one person at a time allowed on the slide.
4. No play equipment on slide.

## **Required Submission of New Facilities, Equipment Changes, or Remodel Plans**

The following pages, with forms, checklists, drawings, and information, are provided for reference only.

### ***Guidelines for Submission of Plans***

Complete and detailed plans shall be submitted to the Arkansas Department of Health. No part of the work shall be undertaken until written approval of the plans has been granted by the Department of Health. The following items shall be included in the submittal:

1. Plans and specifications shall be submitted in triplicate if mailed in. (Refer to following pages)
2. A cost estimate for the project must be provided if mailed in. (Refer to following pages)
3. In-state licensed contractor information/license must appear on the plans.
4. Site plan showing the pool location relative to buildings, property lines, septic systems, and other structures.
5. Pool dimensions, depths, slopes, and volume calculations (refer to drawing examples).
6. Detailed equipment specifications: pump(s), filter(s), heater, chemical feeder, UV/ozone (if used), etc.
7. Piping layout showing suction & return lines, main drains, skimmers, and valves (Refer to following pages).
8. Deck plan showing dimensions, drainage, barriers, and ADA access.
9. Chemical storage and equipment room layout (refer to drawing examples).
10. Electrical (per NEC), Plumbing plan review, and HVAC plan reviews are separate and must have approvals.
11. Address to send plans by mail:

Arkansas Department of Health  
4815 West Markham, Slot-46  
Little Rock, AR 72205  
Attn: Pool Plan Review

12. Electronic submissions may be submitted at: <https://planreview.adh.arkansas.gov/>

Plans can be submitted electronically along with electronic forms and electronic pay capabilities. Customers will now be required to pay for a plan review at the time of submission. New customers must request a customer number before submitting. ADH utilizes the electronic review software, Bluebeam Revu. This portal is for anyone submitting plans but is especially beneficial for submitters who are out of town or out of state, thus saving time, gas, and money.

### Checklist of Specific Items Needed for Pool/Spa Construction Review

Checklist items must be included in written statements &/or drawings to meet compliance, calculations, certifications & verifications. Please make all drawings & writing neat and legible. An 'X' is indicated for required item.

REFERENCE ITEMS	NEW	REMODE
<b>Drawings: Overall Deck &amp; Pool Layout</b>		
Pool/spa shape, perimeter & volume--widths, lengths, depths listed	X	X
Entire deck area---appropriate widths indicated	X	(IF
Fence/barrier locations & indicate type of materials used in construction	X	(IF
Any known landscape features	X	(IF
NO Diving signs/tiles—number & placement indicated	X	(IF APPLY
Slide or other water attraction location(s) & surrounding distances noted	(IF	(IF
Number of ladders, handrails, bench, step locations indicated	X	(IF
Diving board location---distances noted	(IF	(IF
Underwater light locations/type of fixture(s)	X	(IF
Spa timer &/or emergency shut-off location—distances, max temperature noted	X	(IF
Depth marker locations & depths indicated	X	(IF
<b>Drawings: Piping diagrams</b>		
(Sch 40 or greater) pipe sizes & configuration around pool/spa back to equip. room	X	X
Skimmer/Gutter locations/pipe diameters/pipe configuration	X	(IF
Inlet locations/pipe diameters/pipe configuration	X	(IF
Spa jet & dual suction locations/pipe diameters/pipe configuration	X	(IF
Main drain locations/pipe diameters/pipe configuration	X	(IF
Makeup water*: fill spout w/ air gap, auto fill w/RPZ, vacuum breaker on hose bibb	X	(IF
<b>Drawings: Cross section view of pool</b>		
Pool slope(s) of floor	X	X
Pool water depths	X	X
<b>Drawings: Equipment room/pad</b>		
Equipment layout with pipe configurations/sizes	X	X
Flow controller type & location indicated	X	(IF
Flow meter type/location indicated	X	(IF
Backwash waste*—6 inch air gap/location/sight glass indicated	X	(IF
<b>Specification/Catalogue Cut Sheets</b>		
Specific Pump model & pump curve	X	X
Filter model & flow rates	X	X
Chlorinator/feeder--dosages, description & certifications	X	X
Skimmers/Gutters--description & certifications	X	(IF
Water features and/or attractions, slide, or dive board	X	(IF
Underwater lights	X	(IF
Main drain & Spa Suction covers--description & certifications	X	(IF
Spa timer & emergency shut off	X	(IF
<b>Other items that should be written, drawn, noted</b>		
Owner/General Contractor's <b>signed</b> statement of responsibilities—refer to attachment	X	(IF APPLY)
Product list of items/fixtures for pool/spa	X	X
Copy of Arkansas Contractor's license (if job over \$20,000)	X	(IF APPLY)
Pool shell type (concrete, fiberglass, etc) indicated	X	(IF APPLY)
Pool surface light in color with an enduring finish noted	X	(IF APPLY)
Deck: type of material, nonslip & must at least ¼ inch per foot away from pool, drains	X	(IF APPLY)
Fence/barrier: on all four sides, at least 4ft tall, openings no more than 4 inches wide	X	(IF APPLY)
Fence/barrier must not prevent visual observation of pool from the outside	X	(IF APPLY)
All entry gates/doors must be self-closing, self-latching(4ft min),lockable or cardkey	X	(IF APPLY)
Separate fencing for wading pool, attractions and slides	X	(IF APPLY)

Other items (cont'd)	NEW	REMODEL
Step edges marked with contrasting color/tile & have handrails	<b>X</b>	<b>(IF APPLY)</b>
Bench edges have edges marked on top and side	<b>X</b>	<b>(IF APPLY)</b>
Tanning/sun ledge has no drop off edge-need stairs, rail, etc	<b>X</b>	<b>(IF APPLY)</b>
Ladder(s) on deep end of pool	<b>X</b>	<b>(IF APPLY)</b>
Bather facilities approved by plumbing division**	<b>X</b>	<b>(IF APPLY)</b>
Footbaths prohibited—foot showers are acceptable as long as well drain & away from	<b>X</b>	<b>(IF APPLY)</b>
Vacuum head/hose, wall brush, leaf net, telescope pole provided	<b>X</b>	<b>(IF APPLY)</b>
Area lighting calculated for entire pool deck	<b>X</b>	<b>(IF APPLY)</b>
Heating, Venting, Air Conditioning (HVAC) mechanical plans included for indoor**	<b>X</b>	<b>X</b>
Main Drains: 3ft spacing, hydrostatic valves & anti-entrapment covers provided	<b>X</b>	<b>X</b>
Signs: bather load, separate spa signage, pool rules, no diving or lifeguard provided	<b>X</b>	<b>(IF APPLY)</b>
Ring buoy AND shepard's hook provided for every 200ft <sup>2</sup> of water surface area	<b>X</b>	<b>(IF APPLY)</b>
Lifeline required on pools depths more than 5ft 6" AND/OR any slope change in pool	<b>X</b>	<b>(IF APPLY)</b>
Emergency communications provided on premises, First aid kit provided	<b>X</b>	<b>X</b>
DPD Chemical Test Kit: capable of measuring minimum/maximum readings is provided	<b>X</b>	<b>(IF APPLY)</b>
Wiring & grounding for lights and equipment conforms to the National Electric Code.	<b>X</b>	<b>X</b>

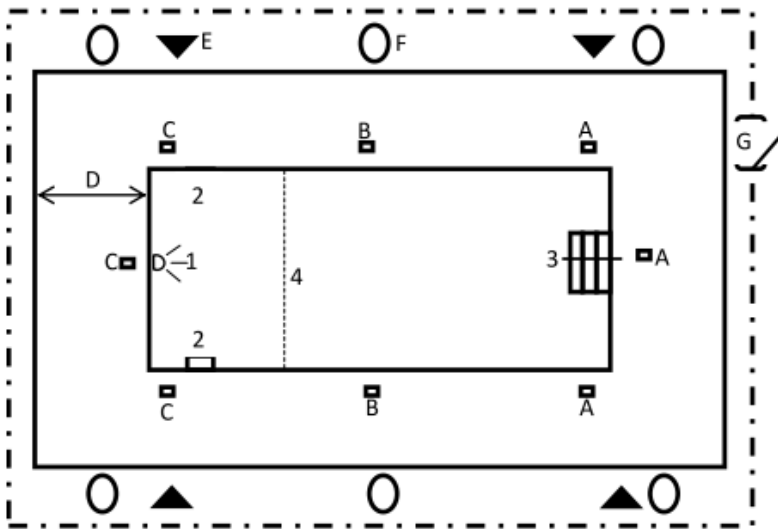
**PLANS MUST BE APPROVED BEFORE ANY CONSTRUCTION BEGINS**

**Remodel means replacement of any portion of the recirculation system, including pool/spa plumbing or perimeter overflow/skimmer equipment, pumps, filters, or disinfection units, or modification of the physical structure of the pool or spa, or any change that would not conform to the original specifications. This does not include repair of small sections of pipes due to leaking, or maintenance activities such as painting, plastering or acid washing. Even if equipment is not replaced during a remodel, the checklist information on that item still must be indicated**

\*Written approval required for water source and/or sewage disposal other than public utility. The ADH Engineering Section regulates public water. County Environmental Health Specialist must approve septic systems.

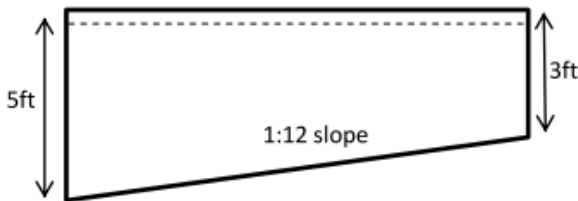
\*\*Consult plumbing and/or HVAC inspectors regarding approval.

### Plan Review Drawing Examples

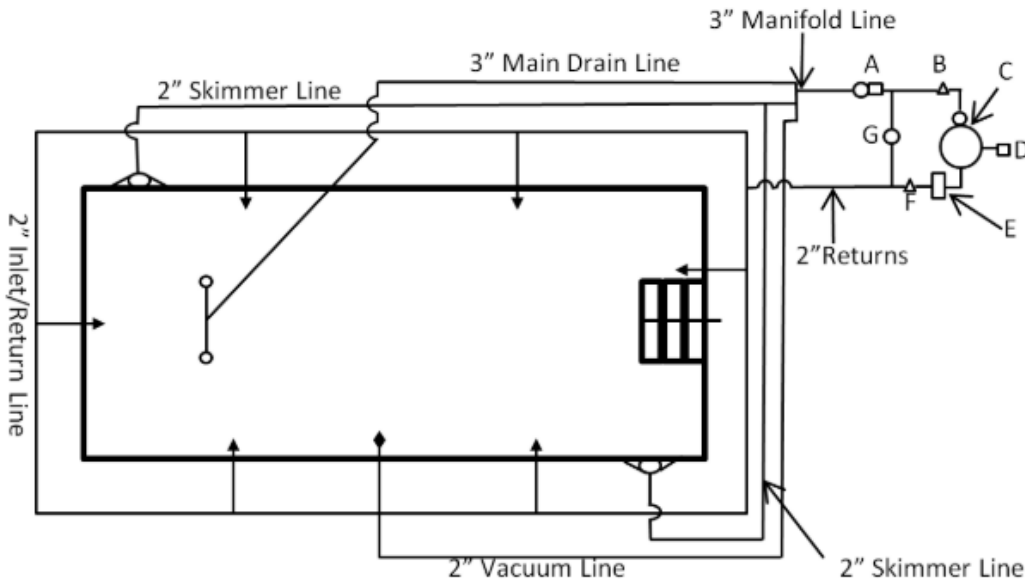


**Overview Layout Example**  
 20ft x 30ft Outdoor Pool  
 Area: 600 sq ft  
 Perimeter: 100ft Volume: 18000 gal

1. Pool Light (output)
2. Ladder(s)
3. Handrail & stairs with edges marked in contrasting color
4. Lifeline at 5ft depth or any slope change
- A. 3ft depth tile w/ no diving tile
- B. 4ft depth tile w/ no diving tile
- C. 5ft depth tile w/ no diving tile
- D. Deck width
- E. Area lighting
- F. Landscaping Features
- G. Self-closing, self-latching, lockable gate with a 4ft high (type) fence w/



**Cross-sectional View Example**  
 Show any slope changes & associated water depths



**Pool Piping & Equipment Example**

- A. Pump (model # & HP)
- B. Flow controller
- C. Filter (model #) w/ multiport valve
- D. Backwash Drain w/ 6" air gap
- E. Heater
- F. Flow meter
- G. Chlorinator (model #)

**EXAMPLE: GENERAL CONTRACTOR/OWNER STATEMENT OF RESPONSIBILITIES**

THE FOLLOWING IS AN EXAMPLE OF A GENERAL CONTRACTOR/OWNER STATEMENT OF RESPONSIBILITIES (IF THEY HAVE ANY). THE ITEMS LISTED MAY VARY ACCORDING TO COMPANY OR JOB. ANYTHING THAT THE POOL COMPANY IS NOT RESPONSIBLE FOR SHOULD BE LISTED AND EXPLAINED.

Date: \_\_\_\_\_

Project: \_\_\_\_\_

Location: \_\_\_\_\_

Pool Contractor: \_\_\_\_\_

In reference to the above project, I as the General Contractor (or Owner) in agreement with (Pool Company Name/Contractor), shall be responsible for the following items:

1. Pool and spa signs (bather load, no-diving, pool and spa rules) posted
2. Perimeter fencing (minimum 4ft high) with no openings more than 4inches wide and surrounds all four sides.
3. All entries/gates into the pool area shall have self-closing, self-latching, lockable, or have cardkey access or alarm
4. Area lighting (5ft candles per sq ft if pool has lights in it or 10ft candles per sq ft if pool contains no lights)
5. Readily accessible emergency communications capable of reaching 911 services located on the premises.
6. First aid equipment
7. All electrical connections (All work will conform to the National Electrical Code)
8. Plumbing approval for all potable water, sanitary drain connections, and bather facilities (Backwash drain must have 6" air gap, overflow spout with air gap/RPZ/vacuum breakers are required for makeup water or hose bibbs)
9. Concrete deck (min. 8ft on outside pool, min. 4ft around indoor pool, 4ft around at least 50% of spa deck) and depth marker tile inlays
10. HVAC on indoor pools/spas (Mechanical drawings are to be sent in with pool plans)
11. Equipment pad/room will be well-lit, drained, and adequately vented.

All items listed shall be installed &/or supplied according to the Arkansas Department of Health: Rules and Regulations Pertaining to Swimming Pools and Other Related Facilities.

General Contractor (or Owner) \_\_\_\_\_



# Arkansas Department of Health Project Cost Estimate Worksheet

*As required by A.C.A. § 20-7-123, this worksheet must be completed and submitted with appropriate fee(s)*

PROJECT NAME \_\_\_\_\_

COUNTY \_\_\_\_\_

PROJECT LOCATION (911 if available) \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

OWNER/SUBMITTER NAME \_\_\_\_\_ PHONE \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_

CITY, STATE, ZIP CODE \_\_\_\_\_

EMAIL (if available) \_\_\_\_\_

PROJECT ID# (ADH Use Only)

**COST ESTIMATE:** ESTIMATED COST SHALL BE BASED ONLY ON THOSE IMPROVEMENTS THAT REQUIRE A DEPARTMENT OF HEALTH REVIEW

- 1. WATER SYSTEM IMPROVEMENTS (non-plumbing)..... \$ \_\_\_\_\_  
*For questions regarding water system improvements ENGINEERING (501) 661-2623*
- 2. SEWER SYSTEM IMPROVEMENTS (non-plumbing)..... \$ \_\_\_\_\_  
*For questions regarding sewer system improvements ENGINEERING (501) 661-2623*
- 3. PLUMBING..... \$ \_\_\_\_\_  
*For questions regarding plumbing plans (501) 661-2650*  
Water Purveyor / Provider: \_\_\_\_\_
- 4. SWIMMING POOL (public)..... \$ \_\_\_\_\_  
*For questions regarding swimming pool plans (501) 661-2171*
- 5. FOOD SERVICE- Retail or Wholesale/Manufacturing (new/reno) ..... \$ \_\_\_\_\_  
*For questions regarding food establishment plans (501) 661-2171*

**TOTAL ESTIMATED COST** ..... \$ \_\_\_\_\_

**A. PLAN REVIEW FEE**..... \$ \_\_\_\_\_  
*1% of total est. cost, not less than \$50.00 and not to exceed \$500.00* (See #1 on page 2)

**TOTAL FEES SUBMITTED**..... \$ \_\_\_\_\_  
*(Checks or money orders made payable to ADH)*

PREPARED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
PRINT NAME: \_\_\_\_\_

**EXPLANATION OF PLAN REVIEW FEES**

#1) A.C.A. § 20-7-123 establishing a fee for the review of plans and specifications which are required by law or regulation to be reviewed by the Department (**Line items # 1,2,3,4,5 on page 1**). The fee is 1% of the estimated cost of improvements, with a **minimum fee of \$50.00** and a **maximum fee of \$500.00**. An Engineering estimate must accompany the plans unless the maximum fee of \$500.00 is paid.

IF TOTAL ESTIMATED COST IS **\$5,000.00 OR LESS**, REVIEW FEE IS **\$50.00**.  
IF TOTAL ESTIMATED COST IS **\$50,000.00 OR MORE**, REVIEW FEE IS **\$500.00**.  
IF TOTAL ESTIMATED COST IS BETWEEN **\$5,000.00 AND \$50,000.00**, CALCULATE AS FOLLOWS:

PLAN REVIEW FEE = (0.01) x (TOTAL ESTIMATED COST) = \$ \_\_\_\_\_

**Complete Below Only for plans utilizing onsite wastewater systems including subdivisions containing lots < 3 acres, mobile home and RV parks.**

#2) A.C.A. § 14-236-116 establishing a fee for the review of plans for subdivisions containing lots <3 acres utilizing individual onsite wastewater systems.

Subdivisions on Individual Onsite Wastewater:

FIRST LOT @ **\$100.00** \$ 100  
ADDITIONAL LOTS @ **\$25.00/each** ..... \$ \_\_\_\_\_  
**TOTAL** ..... \$ \_\_\_\_\_  
(Maximum Fee = **\$1500.00**)

#3) A.C.A. § 20-27-1201 established a review fee for Mobile Home Parks and Recreational Vehicle Parks utilizing onsite wastewater systems and is based on the number of spaces.

Mobile Home & RV Parks utilizing Onsite Wastewater Systems:

2-25 SPACES.....	<b>\$25.00</b>
26-50 SPACES.....	<b>\$50.00</b>
51-75 SPACES.....	<b>\$75.00</b>
76 OR MORE.....	<b>\$100.00</b>

**PLAN REVIEW FEE:**

**Total Submitted (#2 + #3)** \_\_\_\_\_  
(Checks or money orders payable to ADH)

For more information regarding Sections #2 and #3, please contact ADH Engineering 501-661-2623.