

**DEPARTMENT OF HUMAN SERVICES
BUREAU OF HEALTH
RULES RELATING TO PUBLIC SWIMMING POOLS AND SPAS
10-144A CMR 202**

**SECTION 1.
GENERAL PROVISIONS**

1.1. Summary: These rules endeavor to protect the health and safety of the people of Maine by requiring people who construct public swimming pools to submit plans showing proper construction of pools, complying with plumbing code, water quality of pools and proper sanitary facilities. These rules also set standards of operation for public swimming pools.

1.2. Definitions

1.2.A. Artificial pool. "Artificial pool" means a structure made of any material that will provide a tight tank, with smooth and easily cleaned surfaces, intended for bathing or swimming purposes: located either indoors or outdoors, and provided with controlled water supply.

1.2.B. Backwash. "Backwash" refers to the water generated from the process of cleaning the filter medium and/or elements by the reverse flow of water through the filter.

1.2.C. Certified pool operator: "Certified pool operator" means an individual who has taken and passed the National Swimming Pool Foundation's certified pool operators course.

1.2.D. Communicable disease. "Communicable disease" is a disease capable of being transmitted from one person to another.

1.2.E. Department "Department" means the Department of Human Services.

1.2.F. Fence. "Fence" means a good quality barrier not less than 48 inches in height above ground surface and of a character to exclude children.

1.2.G. Operator. "Operator" means the person responsible for the operation and/or maintenance of a pool or spa.

1.2.H. Partly artificial pool "Partly artificial pool" means a pool formed artificially from a natural body of water.

1.2.I. Pedestrian access gate. "Pedestrian access gate" means a gate in a barrier surrounding a pool or spa.

1.2.J. Pool "Pool" as used in these rules shall mean any swimming pool together with buildings and appurtenance used in connection therewith, and shall be construed as including

"artificial," "partly artificial" and "wading" pools. This definition shall not apply to a pool maintained by an individual for use of his family or friends.

1.2.K. Pool water. "Pool water" means any water in a pool or spa.

1.2.L. Pool depth. "Pool depth" means the distance between the floor of the pool and the maximum operating water level.

1.2.M. Private spa. "Private spa" means any constructed spa which is used in connection with a single or multifamily residence and available only to the residents and private guests.

1.2.N. Private swimming pool. "Private swimming pool" means any constructed pool which is used as a swimming pool in connection with a single or multifamily residence and available only to the residents and private guests. Private swimming pools are not covered by these rules.

1.2.O. Public spa. "Public spa" means any constructed spa other than a private spa.

1.2.P. Public swimming pool. "Public swimming pool" means any constructed or prefabricated pool other than a private swimming pool.

1.2.Q. Spa. "Spa" means a unit containing water primarily designed for nontherapeutic use which is not drained, cleaned or refilled for each individual. It may include, but is not limited to, hydrojet circulation, hot water, cold water, mineral baths, air induction bubbles or any combination thereof. The term spa includes, but is not limited to, hot tubs.

1.2.R. Swimming pool. "Swimming pool" means any basin, chamber or tank constructed of impervious material, located either indoors or outdoors containing an artificial body of water for swimming or recreational bathing and having a depth of twenty-four inches (24") or more at any point. This includes any related equipment, structures, areas and enclosures that are intended for the use of persons using or operating the swimming pool such as equipment, dressing lockers, showers and toilet rooms.

1.2.S. Wading pools. "Wading pools " means a pool with a maximum water depth of twenty-four inches (24"). The water depth at the perimeter shall not exceed eighteen inches (18"). Water depths may be reduced from the above maximums and brought to zero at the most shallow point.

SECTION 2 PLANS AND CONSTRUCTION

2.1. Registration.

2.1.A. No city, town, village, plantation, institution, school, civic club, organization, person, firm or corporation, shall operate or maintain any pool without first having registered the same with the, Department of Human Services. (Forms for this purpose will be furnished by the Division of Health Engineering upon request).

2.2. Approval of Plans.

2.2.A. No city, town, village, plantation, institution, school, civic club, organization, person, firm, or corporation shall construct any pool or make changes in any already built or in the appurtenances thereof until the plans have been submitted to and approval received from the Department of Human Services.

2.2.B. Minimum standards for swimming pool design shall be those set forth by the Standard for Public Swimming Pools ANSI/NSPI-1 1991

2.3. Plans and Specifications.

2.3.A. A person proposing to construct, reconstruct or alter a swimming pool or auxiliary structure or equipment shall submit legible plans and specifications to the Department for review and written approval prior to commencing the work and in advance of the issuance of any building, plumbing or electrical permit.

2.3.B. Plans submitted for approval pursuant to this section shall be drawn to a scale of 1/4 inch equals 1 foot, except that plans for spa pools shall be drawn to a scale of 1 inch equals 1 foot.

2.3.C. The Department may require the submission of such additional information as may be required to determine the compliance of plans and specifications submitted for approval.

2.3.D. Any pool located on water shed of a spring, lake, stream or other body of water used as a source of public or private water supply shall be so operated as not to create a menace to such supply.

2.3.E. Within 30 days of the receipt of plans and specifications, the Department shall notify the person submitting the plans and specifications of their approval or disapproval.

2.3.F. When submitting an application for review of a public swimming pool to the Department, the application and/or designer must include the following for a complete application:

2.3.F.1. Plan(s) of the pool showing depths, area, and safety features, complying with the National Spa and Pool Institute's Minimum Standards for Public Swimming Pools.

2.3.F.2. Plans and/or manufacturer's specifications for pumps and filtering equipment.

2.3.F.3. A completed HHE 200 (subsurface waste water disposal system application) shall be submitted to the Department for approval if a public waste water disposal system is not utilized.

2.3.F.4. A completed Department of Human Services Swimming Pool Registration Form.

2.3.F.5. A review fee of \$15 is required. A check or money order made payable to the "Treasurer of State" shall be submitted.

2.3.F.6. Records. The Department shall retain one copy of the plans and specifications submitted for approval.

2.4. Initial Inspection.

2.4.A. The swimming pool owner, or his designated agent, shall notify the Department at least two working days before guniting or constructing the pool shell to allow inspection and approval by the Department if needed. Following pool construction, the Department shall again be notified at least two days in advance of placing the pool in operation to allow for final inspection and approval.

2.4.B. No pool shall be placed in use without the written approval of the Department.

SECTION 3 Maintenance and Operation

3.1. Pool Supervision Responsibility.

3.1.A. Every pool shall be under the supervision of a person who is fully capable of, and shall assume responsibility for, compliance with all requirements relating to pool operation, maintenance and safety of bathers. This person should be a certified pool operator (CPO) or have equivalent training.

3.1.B. No pools shall be used or available for use unless all of the requirements of subsection 3.1.A. and the following are complied with.

3.1.C. Routine (e.g., daily and weekly) operating procedures shall be permanently posted in a location accessible to and frequented by the operator. They shall also be available for viewing by representatives from the Department.

3.1.D. Manufacturers' instructions for operation and maintenance of mechanical and electrical equipment shall be kept available for the operator and representatives from the Department.

3.2. Clarity of Water.

3.2.A. The recirculation and purification system shall be operated and maintained so as to keep the pool water clean and clear. Under no circumstances shall the pool be used if the main drain is not clearly visible from the deck. Any pool closed by the Department shall not be reopened until the water is clean and clear, and upon specific written approval of the Department. .

3.2.B. The water of every wading pool shall be kept sufficiently clear so that the bottom of the wading pool is visible at all times.

3.3. Chemical Operational Parameters

3.3.A. The pool water shall be continuously disinfected by a disinfecting agent that imparts an easily measured residual. The disinfecting agent used shall be subject to field testing

procedures that are simple and accurate. Gaseous chlorine, chlorine compounds, bromine compounds, or other bactericidal agents, approved by the Department, shall be maintained at the following ranges:

3.3.A.1. Disinfectant Levels for pools and spas

3.3.A.1.a. If chlorine is used for disinfection, the free chlorine residual shall be maintained at 1.0 – 3.0 ppm in pools and 2.0 – 10.0 ppm in spas.

3.3.A.1.b. If Bromine is used for disinfection, the bromine residual shall be maintained at 2.0 – 4.0 ppm in pools and 2.0 – 10.0 ppm in spas.

3.3.A.1.c. pH shall be maintained between 7.2 and 7.8. See appendix A for additional information.

3.3.A.1.d. If chlorine gas is used to chlorinate the pool, the requirements listed in Appendix B must be met.

3.4. Cleaning Systems

3.4.A. A built-in or portable type vacuum cleaning system shall be provided which is capable of removing sediment from all parts of the pool floor. When jet-type units are used, they shall be provided with approved type backflow protection for the water system.

3.5. Operation Records.

3.5.A. The operator of each pool open for use shall keep a daily record of information regarding operation, including readings of disinfectant residual, pH and maintenance procedures such as cleaning of filters and quantity and types of chemicals used. Data collected pursuant to subsections 3.3.A.1. shall be maintained at least one year for inspection by the Department and shall be available to the Department upon request.

3.5.B. Appropriate test kits for measuring pH and concentration of the disinfectant used shall be provided at each pool and/or spa.

SECTION 4

Supplemental Layers of Protection - Outdoor Swimming Pools

4.1. Walls, Fences and Structures as Barriers

4.1.A. Barrier walls and fences may be stand-alone walls and fences or may be in combination with a structural pool, spa or hot tub walls, or a building/dwelling wall to form the barrier around the swimming pool, spa or hot tub.

4.2. Dimensions

4.2.A. The top of the wall/fence shall be at least forty-eight inches (48") (1.2m) above grade measured on the side of the wall/fence which faces away from the swimming pool. The

Maximum vertical clearance between grade and the bottom of the wall/fence shall be four inches (4") (102mm).

4.3. Pedestrian access gates

4.3.A. Access gates in the barrier shall be self-closing, self-latching, accommodate a locking device and shall open outward away from the pool, spa or hot tub except when natural topography or other conditions dictate that it open inward.

Release of the latch on the self-latching device for the gate shall be activated **either**:

4.3.A.1. at a height no less than fifty-four inches (54") (1372mm) above grade for chain-link access gates and at a height no less than fifty-four inches (54") (1372mm) above the horizontal bottom rail of a picket/ornamental access gate, **or**

4.3.A.2. on the pool, spa or hot tub side of the gate at a distance no less than three inches (3") (76mm) below the top of the gate if the gate and barrier have no opening greater than 1/2 inch within 18 inches of the release mechanism. Where a self-latching device is also self-locking and is opened by means of a key, electronic opener, or integral combination lock, it may be located at any height on the gate, so long as it does not negate the function of the gate.

4.3.B. . Other Access Gates

4.3.B.1. Gates other than pedestrian access gate need not have a self-closing, self-latching feature but shall be provided with a means to secure the gate when it is not in use.

4.3.B.2. Wall of Building with 3-side fencing as a barrier

4.3.B.2.a. A wall of a building/dwelling may be used to form the barrier, or part of the barrier.

SECTION 5

Ancillary Area and Facilities

5.1. Bathhouse, Dressing, Shower, and Toilet Facilities

5.1.A. A bath house with dressing room, shower and toilet facility shall be located within five hundred feet (500') of pool. EXCEPTION: shower and dressing facilities may not be required,when bathers have access to such facilities in adjacent living quarters. Public toilet facilities shall be provided for users of a pool.

5.1.B. Dressing and sanitary facilities shall meet handicapped accessibility standards.

5.1.C. Dressing and sanitary facilities shall be provided with separations for each sex with no interconnection. The rooms shall be well-lighted, drained, ventilated, and of good construction, with impervious materials. They shall be developed and planned so that good sanitation can be maintained throughout the building at all times. This will not prohibit the facility from supplying a family changing room in addition to rooms for each sex.

5.1.D. Bathing Suits, Caps and Towels

5.1.D.1. Bathing suits and towels furnished by the management shall be laundered and clean, and caps shall be sanitized after each usage. Nose clips, fins and goggles furnished by the management shall also be sanitized after each usage.

5.1.D.2. All infants and children that are not toilet trained shall wear rubber swim pants while in the pool.

5.1.E. A sign shall be posted instructing users of the pool to shower prior to entering the pool.

SECTION 6 Specific Safety Features and Requirements

6.1. Handholds

6.1.A. A public pool shall be provided with a suitable handhold around its perimeter in areas where depths exceed three feet six inches (3' 6"). Handholds shall be provided no further apart than four feet (4') and shall consist of any one (1) or a combination of the items listed in Articles 6.1.A.1 thru 6.1.A.3.

6.1.A.1. Coping, ledge, or deck along the immediate top edge of the pool which provides a slip-resisting surface of at least four inches (4") minimum horizontal width and located at or not more than twelve inches (12") above the waterline; or

6.1.A.2. Ladders, stairs, or seat ledges: or

6.1.A.3. A secured rope or railing placed at or not more than twelve inches (12") above the waterline.

6.2. Rope and Float Line

6.2.A. A rope and float line shall be provided between one (1') and two feet (2') on the shallow side of the break in grade between the shallow and deep portions of the swimming pool, with its position marked with visible floats at not greater than seven foot (7') intervals. This line may be removed for swim meets, lap swimming, aerobics, etc.

6.2.B. The rope and float line shall be securely fastened to wall anchors of corrosion resisting materials and of the type which shall be recessed or have no projection that will constitute a hazard when the line is removed.

6.2.C. The line shall be of sufficient size and strength to offer a good handhold and support loads normally imposed by users.

6.3. Depth Markers

6.3.A. Depth of water in feet shall be plainly and conspicuously marked at or above the waterline on the vertical pool wall and on the top of the coping or edge of the deck or walk next to the pool.

6.3.B. Depth markers on the vertical pool wall shall be positioned to be read from the water side.

6.3.C. Depth markers on the deck shall be within eighteen inches (18") of the water edge and positioned to be read while standing on the deck facing the water.

6.3.D. Depth markers shall be slip-resisting.
Depth markers shall be installed at the maximum and minimum water depths and at all points of slope change.

6.3.E. Depth markers shall be installed at intermediate increments of water depth not to exceed two feet (2'), nor spaced at distances greater than twenty-five foot (25') intervals.

6.3.F. Depth markers shall be arranged uniformly on both sides and both ends of the pool.

6.3.G. Depth markers on irregularly shaped pools shall designate depths at all major deviations in shape as well as conform to the foregoing articles 6.3.A. thru 6.3.F..

6.3.H. Depth markers shall have a four inch (4") minimum height. Numbers shall be of contrasting color to the background on which they are applied, and the color shall be of a permanent nature.

6.3.I. Any steps leading into a new pool should be of a contrasting color.

6.3.J. The transition point of a new pool from the shallow area to the deep area shall be visually set apart with a marked line of contrasting color.

6.4. Lifesaving Equipment

6.4.A. Public swimming pools shall have lifesaving equipment conspicuously and conveniently on hand at all times by the side of the pool.

6.4.B. Each pool shall be equipped with a light, strong pole not less than twelve feet (12') long, including a body hook.

6.4.C. Each pool shall be equipped with a minimum one-fourth inch (1/4") diameter throwing rope as long as one and one-half (1 1/2) times the maximum width of the pool or fifty feet (50'), whichever is less, to which has been firmly attached a ring buoy with an outside diameter of approximately fifteen inches (15") or a similar flotation device.

6.4.D. The location of the nearest telephone shall be posted in the immediate vicinity of the pool. This telephone shall have posted names and phone numbers of the nearest available police, fire, ambulance service and/or rescue unit.

6.4.E. A first aid kit including barrier protection (gloves and rescue breathing, shall be available at all times. Barrier precautions such as gloves and rescue breathing shall be included.

6.4.F. Every pool without a lifeguard shall post a conspicuous sign near the pool stating that there is no lifeguard on duty and that all children must be supervised in the pool area.

6.5 Entrapment prevention

6.5.A. If the suction outlet system, such as a filtration system, booster system, automatic cleaning system, etc., has a single suction outlet, or multiple suction outlets which can be isolated by valves, each suction outlet shall protect against user entrapment by either an antivortex cover, a twelve inch by twelve inch or larger grate or other means approved by the Department.

6.5.B. Emergency shutoff switches, accessible to the public, shall also be installed to shut off the pool or spa when a swimmer or bather becomes entrapped, if section 6.5.A. cannot be met.

6.6 Rules posted

6.6.A. Facility rules for the safe use of the pool or spa shall be posted in a conspicuous place.

SECTION 7 HYGIENIC CONSIDERATIONS

7.1. Common Towels, Cups, Etc.

7.1.A. The use of shared towels, drinking cups, combs, hair brushes or other common toilet articles shall be prohibited.

7.2. Pollution of Pool Prohibited

7.2.A. Urinating, discharge of fecal matter, expectorating or blowing the nose in any pool shall be prohibited. The Department shall require posting of notices directing the bathers to make use of the toilets and showers before entering the pool.

7.2.B. If a fecal accident occurs, the pool shall be closed and shock chlorinated to 20 PPM. The water shall be continuously filtered to obtain approximately 3 turnovers. After at least 12 hours, the chlorine level may be reduced to the 1.0 to 3.0 PPM range and the pool reopened after a total of 24 hours.

7.3. Health of Employees and Patrons.

7.3.A. No person ill with vomiting or diarrhea shall use the pool or spa.

7.3.B. No person with infectious skin rashes shall use the pool or spa.

SECTION 8

WATER SUPPLY AND WASTE WATER DISPOSAL

8.1. Pool water supply

8.1.A. The water supply shall be adequate, of a safe, sanitary quality, and from a source approved by the Department.

8.1.B. All portions of the water distribution system serving the swimming pool and auxiliary facilities (spas, wading pools, etc.) shall be protected against backflow and back-siphonage. Water introduced into the pool, either directly or to the recirculation system, shall be supplied through an air gap or by another method approved by the Department

8.2. Pool water Disposal

8.2.A. Pool water shall be disposed of by a method approved by the Department.

8.2.B. The operator shall obtain permission from the proper authority before any pool water is disposed of in a public sewer system or in a storm drain system.

8.2.C. The operator shall obtain permission from the Department of Environmental Protection; (DEP) or other proper authority, before any pool water is disposed of on any surface or any body of water.

8.2.D. No pool water shall be disposed of in a private sewage disposal system.

8.3. Backwash Disposal

8.3.A. The operator shall obtain permission from the proper authority before any backwash is disposed of in a public sewer system or in a storm drain system.

8.3.B. No backwash shall be disposed of on any surface or in any body of water.

8.3.C. A drywell, approved by Department may be used for the disposal of backwash.

8.3.D. Backwash may be discharged in an approved subsurface disposal system sized, designed and installed in conformance with the Maine Subsurface Waste Water Disposal Rules, 10-144A CMR 241.

8.4. Plans and specifications for all installations shall be submitted to the Department for approval prior to the commencement of any work. All piping, equipment and construction shall be equal to the types prescribed in the installation requirements of the Standard for Public Swimming Pools ANSI / NSPI - 1 1991.

SECTION 9

Spa Pool Special Requirements

9.1. Aeration System. A spa pool aeration and/or jet system shall be completely separate from its filtration system and shall not be interconnected with any non-spa pool.

9.2. Maximum Operating Temperature. The maximum allowable water temperature shall be 104 F for a spa pool. A spa pool shall be equipped with an accurate thermometer designed for pool use.

9.3. Spa Use parameters

9.3.A. A precaution sign shall be provided with the spa use parameters listed below. The spa use parameters sign shall be mounted by the operator in a prominent location. Lettering shall be at least one (1) inch in height and be of contrasting color to the background on which they are applied.

Risk of Fetus Damage - Hot water exposure limitations vary from person to person. Pregnant women and small children should not use spa prior to medical consultation.

Risk of Drowning - Persons suffering from heart disease, diabetes, high or low blood pressure and other health problems should not enter the spa without prior medical consultation and permission from their doctor.

Risk of Drowning - Do not use the spa while under the influence of alcohol, narcotics, or other drugs that cause sleepiness, drowsiness, or raise/lower blood pressure.

Risk of Child Drowning - Unsupervised use by children is prohibited.

Risk of Injury - Before entering the spa, check spa temperature before each use. The spa temperature shall not exceed 104 F.

Risk of Drowning - Use caution when bathing alone. Overexposure to hot water may cause nausea, dizziness, and fainting.

Risk of Drowning - Do not use the spa while it is being drained.

Risk of Injury - Enter and exit slowly.

Risk of Injury - Keep all breakable objects out of the spa area.

Risk of Shock - Never place electrical appliances (telephone, radio, TV, etc.) within five feet (5') of the spa.

Risk of Shock - Spa shall not be operated during severe weather conditions, i.e. electrical storms, tornadoes, etc.

Risk of Drowning - Do not allow the use of or operate spa if the suction fitting is missing, broken or loose.

9.4. Spas and Hot Tubs should be in compliance with the Standard for Public Spas ANSI/NSPI - 2 1999.

SECTION 10 Inspection and Closure

10.1. Inspection

10.1.A. All pools shall be open for inspection by any authorized agent of the Department of Human Services at all reasonable times.

10.2. Pool Closure.

10.2.A. If, in the opinion of the Department, a pool is maintained or operated in a manner which creates an unhealthful, unsafe, or unsanitary condition, the pool may be closed by the Department. Prior to such closure, the Department shall issue a notice in writing enumerating instances of failure to comply with these rules. Such a pool shall not be reopened until correction is made, and upon specific written approval of the Department.

10.2.B. Unhealthful, unsafe or unsanitary conditions include, but are not limited to, the failure to meet clarity, disinfection, pH, safety or bacteriological standards.

10.2.C. The Department reserves the right to test pool or spa water for bacterial contamination as necessary.

Section 11 Variances and appeals

11.1 Variances

11.1.A. A pool or spa operator may submit a request for a variance from these rules.

11.1.A.1. The variance request shall be in writing and shall state:

11.1.A.1.a. The reason(s) for the variance request; and

11.1.A.1.b. The reason(s) why the specific requirement(s) of the rules cannot be met.

11.1.B. The Department will review the request for a variance and respond in writing within 30 days.

11.2 Appeals

11.2.A. Anyone aggrieved by a decision of the Department in regard to these rules may request an administrative hearing in conformance with the Administrative Procedures Act, 5 MRSA chapter 375. The request must be in writing and must specify the reasons for the appeal. The written request must be submitted to the Department no later than thirty (30) days from receipt of notice of the Department's decision. All hearings shall be conducted in accordance with the Department's Office of Administrative Hearings – Administrative Hearing Regulations (10-144 CMR Chapter 1).

Basis Statement: These rules shall be construed and applied to promote their underlying purpose of protecting the public health and safety.

Statutory Authority: 22 MRSA § 1631 to 1635 and 22 MRSA § 2661 to 2669

Effective Date: June 1,2000

Non-Discrimination Notice

In accordance with Title VI of the Civil Rights Act of 1964 (42 U.S.C. §1981, 2000d et seq.) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), the Age Discrimination Act of 1975, as amended (42 U.S.C. §6101 et seq.), Title II of the Americans with Disabilities Act of 1990 (42 U.S.C. §12131 et seq.), and Title IX of the Education Amendments of 1972, (34 C.F.R. Parts 100, 104, 106 and 110), the Maine Department of Human Services does not discriminate on the basis of sex, race, color, national origin, disability or age in admission or access to or treatment or employment in its programs and activities.

Kim Pierce, Civil Rights Compliance Coordinator, has been designated to coordinate our efforts to comply with the U.S. Department of Health and Human Services regulations (45 C.F.R. Parts 80, 84, and 91), the Department of Justice regulations (28 C.F.R. part 35), and the U.S. Department of Education regulations (34 C.F.R. Part 106) implementing these Federal laws. Inquiries concerning the application of these regulations and our grievance procedures for resolution of complaints alleging discrimination may be referred to Kim Pierce at 221 State Street, Augusta, ME 04333, telephone number: (207) 287-3488 (Voice) or (207) 287-4479 (TDD), or the Assistant Secretary of the Office of Civil Rights of the applicable department (e.g. the Department of Education), Washington, D.C.

Appropriation 010-10A-2450-012

APPENDIX A

CHEMICAL OPERATIONAL PARAMETERS

These guidelines set forth the suggested operational parameters for the proper chemical treatment and maintenance of swimming pool waters.

Chemical treatment alone will not produce sanitary pool water. A filtration system in proper operational condition is also required to attain sparkling clear, polished sanitary water.

	<u>Minimum</u>	<u>Ideal</u>	<u>Maximum</u>	<u>Comments</u>
A. <u>Disinfectant Levels,</u>				
1. Free chlorine, ppm				
Pool	1	1-3	3	Hot weather/heavy use may require operation at or near maximum levels.
Spa	2	3-5	10	Regular superchlorination is recommended (see E-1).
2. Combined chlorine, PPM pool & spa	None	None	0.2	High combined chlorine results in reduced chemical efficacy. Take remedial action to establish break point chlorination. See Section E-1 below. Other signs of combined chlorine: - Sharp chlorinous odor - Eye irritation - Algae growth
3. Bromine, ppm				
pool	2	2-4	4	
spa	2	3-5	10	

	<u>Minimum</u>	<u>Ideal</u>	<u>Maximum</u>	<u>Comments</u>
B. <u>Chemical Values</u>				
1. pH	7.2	7.4-7.6	7.8	<p>If pH is:</p> <p><u>Too High</u></p> <ul style="list-style-type: none"> - Low chlorine- efficiency - Scale formation - Cloudy water- - Eye discomfort <p><u>Too Low:</u></p> <ul style="list-style-type: none"> - Rapid dissipation of disinfectant - Plaster and concrete etching - Eye discomfort - Corrosion of metals - Vinyl liner damage
2. Total alkalinity (buffering), ppm as CaCO ₃	60	80-100 for calcium hypochlorite, lithium hypochlorite, and sodium hypochlorite	180	<p>If total alkalinity is:</p> <p><u>Too Low:</u></p> <ul style="list-style-type: none"> - pH bounce - Corrosion tendency <p><u>Too High:</u></p> <ul style="list-style-type: none"> - Cloudy water - Increased scaling potential - pH tends to be too high
		100-120 For sodium dichlor, trichlor, chlorine gas, and bromine compounds		
3. Total dissolved solids, ppm	300	1000-2000 ¹	3000 ²	<p>These values offered as guidelines rather than absolute values to indicate concern for accumulation of impurities in the course of operation. Excessive high TDS may lead to hazy water, corrosion of fixtures, etc., and can be reduced by partial draining with addition of fresh water.</p> <p>(1) High initial TDS may indicate poor water quality due to corrosive mineral salts, humus, or organic matter. Consult local water authority.</p> <p>(2) Increasing TDS indicates build up of impurities to be controlled by partial drain/refill with fresh water.</p>

	<u>Minimum</u>	<u>Ideal</u>	<u>Maximum</u>	<u>Comments</u>
4. Calcium hardness, ppm, as CaCO ₃	150	200-400	500-1000+	Operation of pools at maximum hardness will depend on alkalinity (buffering) requirements of the sanitizer used. Minimum alkalinity and lower pH must be used with maximum hardness. (Over 500 ppm).
5. Heavy metals	None	None	None	<p>If heavy metals, such as copper, iron, manganese, are present:</p> <ul style="list-style-type: none"> - Staining may occur - Water may discolor - Chlorine dissipates rapidly - Filter may plug - May indicate pH too low, corrosion, etc.

C. Biological Values

1. Algae	None	None	None	<p>If algae are observed: Shock treat pool or spa. (Refer to Section E.3)</p> <ul style="list-style-type: none"> - Supplement with brushing and vacuuming. - Maintain adequate disinfectant residual. - Use approved algicide according to label directions. (Section E-5).
2. Bacteria	None	None	None	<p>If bacteria count exceeds local health department requirements:</p> <ul style="list-style-type: none"> - Superchlorinate and follow proper maintenance procedures. - Maintain proper disinfectant residual.

	<u>Minimum</u>	<u>Ideal</u>	<u>Maximum</u>	<u>Comments</u>
D. <u>Stabilizer</u> (if used)				
1. Cyanuric acid, PPM	10	30-50	150: Except where limited by health dept., requirements often to 100 PPM	If stabilizer is: <u>Too Low:</u> - Chlorine residual rapidly destroyed by sunlight <u>Too High:</u> -May exceed local health department regulations -May reduce chlorine efficacy

Note: Stabilizer is not needed in indoor or brominated pools.

E. Remedial Practices

1. Superchlorination frequency	as needed	Every other week	Weekly when the temperature is over 85°F	Note: Some high use pools may need super chlorination three times a week or more as a preventative measure or when combined chlorine is over 0.2 ppm.
2. Superchlorination to establish break point, dosage in ppm	5	10		When combined chlorine is over 0.2 ppm or when eye irritation persists. Repeat as needed.
3. Shock treatment, dosage in ppm	10			Nonchlorine oxidizers are not considered biocidal but may reduce organic contaminants.
4. Clarifying/Floccing frequency	--	When needed		Use all clarifiers following manufacturer's directions.
5. Algicides		Follow manufacturer's directions		Use US E.P.A--registered products.

	<u>Minimum</u>	<u>Ideal</u>	<u>Maximum</u>	<u>Comments</u>														
F. <u>Temperature</u>																		
1. Temperature, °F		78°-82°	104°F	<p>If temperature is:</p> <table border="0"> <tr> <td><u>Too Low</u></td> <td><u>Too High</u></td> </tr> <tr> <td>- Bather discomfort</td> <td>- Excessive fuel requirement</td> </tr> <tr> <td></td> <td>- Increased evaporation</td> </tr> <tr> <td></td> <td>- Bather discomfort</td> </tr> <tr> <td></td> <td>- Increased scaling potential</td> </tr> <tr> <td></td> <td>- Increased use of disinfectants</td> </tr> <tr> <td></td> <td>- Increased potential for corrosion</td> </tr> </table>	<u>Too Low</u>	<u>Too High</u>	- Bather discomfort	- Excessive fuel requirement		- Increased evaporation		- Bather discomfort		- Increased scaling potential		- Increased use of disinfectants		- Increased potential for corrosion
<u>Too Low</u>	<u>Too High</u>																	
- Bather discomfort	- Excessive fuel requirement																	
	- Increased evaporation																	
	- Bather discomfort																	
	- Increased scaling potential																	
	- Increased use of disinfectants																	
	- Increased potential for corrosion																	
G. <u>Water Clarity</u>																		
1. Water turbidity				<p>If water is turbid:</p> <ul style="list-style-type: none"> - Disinfectant level may be low - Filtration system may be inoperative - Improper chemical balance (Section B) - Bottom should be clearly visible at the deepest part of the pool. - Consult remedial practices (Section E). 														
H. <u>Oxidation Reduction Potential</u>																		
1. ORP		650 MV		<p>When chlorine or bromine is used as the primary disinfectant, ORP can be used as a supplemental measurement of proper sanitizer activity. The use of ORP testing does not eliminate or supersede the need for testing the sanitizer level with standard test kits, and ORP reading may be affected by a number of factors including (1) pH, (2) probe film, (3) cyanuric acid, and (4) other. Follow manufacturer's recommendations.</p>														

APPENDIX B

USE OF GAS CHLORINE

GENERAL

Chlorine is one of the chemical elements. The gas has a characteristic odor and greenish yellow color and is about two and one-half (2-1/2) times as heavy as air. Chlorine is shipped in Department of Transportation specification steel containers; standard sizes contain either 100 or 150 pounds of chlorine. In the cylinder the chlorine has both a liquid and a gas phase. All cylinders are equipped with the Chlorine Institute standard chlorine cylinder valve.

Chlorine is a "hazardous material" subject to Department of Transportation requirements. When used for pool disinfection, chlorine is considered a pesticide and as such is subject to pertinent regulations of the U.S. Environmental Protection Agency, as well as various state agriculture and environmental regulations.

Users of chlorine must be trained as to the proper procedures for handling chlorine and as to appropriate emergency procedures. Detailed information is available from chlorine suppliers and the Chlorine Institute, 2001 L Street, N.W., Washington, D.C. 20036.

EQUIPMENT AND INSTALLATION

Chlorination equipment should be located so that equipment failure or malfunction will have minimum effect on evacuation of pool patrons in an emergency.

Elemental Chlorine feeders (chlorinators) should be activated by a booster pump using recirculated water supplied via the recirculation system. The booster pump should be interlocked to the filter pump to prevent feeding of chlorine when the recirculation pump is not running.

The chlorinator, cylinders of chlorine and associated equipment should be housed in a reasonably gas-tight and corrosion-resisting housing having a floor area adequate for the purpose. Cylinders should always be stored in an upright position and properly secured.

All enclosures should be located at or above ground level. The enclosure should be provided with: ducts from the bottom of the enclosure to the atmosphere in an unrestricted area, a motor-driven exhaust fan capable of producing at least one air change per minute, and louvers of good design near the top of the enclosure for admitting fresh air. Warning signs should be posted on the doors. It is recommended that the doors to the chlorine room should open away from the pool.

Electrical switches for the control of the artificial lighting and ventilation should be on the outside of the enclosure adjacent to the door.

Contents of a chlorine cylinder can be determined only by weight; therefore, facilities should include a scale suitable for weighing the cylinders. Changing cylinder(s) should be accomplished only after weighing proves

contents of the cylinder to be exhausted. Care must be taken to prevent water suck-back into the cylinder when empty by closing the cylinder valve.

Connections from the cylinders to the system depend on the type of chlorinator to be used and should comply with the chlorinator manufacturer's recommendation.

It is recommended that an automatic chlorine leak detector and alarm be installed in the chlorinator room .

Respirators approved by the National Institute for Occupational Safety and Health (NIOSH) should be provided for protection against chlorine. It is recommended that at least one approved self-contained breathing apparatus be provided. Respiratory equipment should be mounted outside the chlorine enclosure. Occupational Safety and Health Administration (OSHA) regulations require training and maintenance program for respirators.

Containers may be stored indoors or outdoors. Full and empty cylinders should be segregated and appropriately tagged. Storage conditions should: (a) minimize external corrosion, (b) be clean and free of trash, (c) not be near an elevator or ventilation system, (d) be away from elevated temperatures or heat sources.

OPERATING PROCEDURES

A specific person should be made responsible for chlorination operations and should be trained in the performance of routine operations including emergency procedures and leak control procedures.

Chlorine cylinders must be handled with care. Valve protection caps and valve outlet caps should be in place at all times except when the cylinder is connected for use. Cylinders must not be dropped and should be protected from falling objects. Cylinders should be used on a first-in, first-out basis. New, approved washers should be used each time a cylinder is connected.

It is recommended that a safety wall chart be posted in or near the chlorine enclosure and a second chart in the pool office near the telephone. Such charts are available from many suppliers and from the Chlorine Institute, 2001 L Street, N.W., Washington, D.C. 20036. The telephone number of the chlorine supplier should be shown on the chart.

Although chlorine suppliers make every effort to furnish chlorine in properly conditioned cylinders, chlorine gas leaks may still occur. Pool personnel should be informed about leak control procedures and consideration should be given to providing a Chlorine Institute Emergency Kit A.

Chlorine suppliers are equipped with a Chlorine Institute Emergency Kit A, which contains devices for capping leaks at cylinder valves and some leaks which occur in the cylinder wall. Further information on these kits and training slides demonstrating their use are available from the Chlorine Institute.

As soon as a container is empty, the valve should be closed and the lines disconnected. The outlet cap should be applied promptly and the valve protection hood attached. The open end of the disconnected line should be plugged or capped promptly to keep atmospheric moisture out of the system.

To find a chlorine gas leak, use a plastic bottle containing 26 degree BE Ammonia capable of releasing only vapors when squeezed. A white cloud will result if there is any chlorine leakage. Never use water on a chlorine leak.

For additional information, contact The Chlorine Institute, Inc., 2001 L Street, N.W., Washington, D.C. 20036, (202) 775-2790, and request a copy of the "Chlorine Manual" and the wall chart entitled "Handling Chlorine Cylinders & Ton Containers."

Appendix C (Section 6.6.A.)

A sample of rules that could be posted in a conspicuous place at a pool.

No Unsupervised Small Children Allowed in the Pool Area or Pool. (Section 6.4.F.)

All Infants and Small Children not Toilet Trained Must Wear Rubber Swim Pants While in the Pool. (Section 5.1.D.2.)

All Pool Users Shall Shower Prior to Entering the Pool. (Section 5.1.E.)

All Pool Users Shall Avoid Using the Pool if They are Experiencing Symptoms of Vomiting, Diarrhea, Skin Rash, or Open Wounds. (Section 7.3.)

“No Diving.” Or “ Shallow Water No Diving.” Or “Dive Only at Designated Areas.”

No Swimming in Diving Area if Diving Board is in Use.

Spitting, spouting water, and blowing one’s nose in the water are not allowed.

No Food, Drink, or Glass Containers Allowed

No animals in pool or on pool deck.

Swimmers must wear appropriate swimming attire.

No Running or Horseplay Allowed.

No Floatation Devices, Toys or Masks & Snorkel Equipment Allowed.

Only Guests of This Facility May Use the Pool.

(These are only a few samples of rules that could be posted at a pool. Other rules may be posted at the owner’s discretion.)