Fiscal Note for 15A NCAC 18A .2518, .2539

Agency:	North Carolina Commission for Public Health Department of Health and Human Services Division of Public Health Environmental Health Section
Rule Citation(s):	15A NCAC 18A .2518 Circulation System (Readoption) 15A NCAC 18A .2539 Suction Hazard Reduction (Amendment)
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Rulemaking Authority:	N.C.G.S. 130A-282
Impact Summary:	State Government: Yes Local Government: Yes Private Sector: Yes Substantial Impact: No

Introduction and Purpose

Pursuant to G.S. 130A-282, the Commission for Public Health (CPH) is directed to adopt and the Department of Health and Human Services (DHHS) is directed to enforce rules concerning the construction and operation of public swimming pools. These rules are set forth at 15A NCAC 18A Section .2500. In accordance with G.S. 150B-21.3A, one public swimming pool rule (15A NCAC 18A .2518) is proposed for readoption. This rule concerns water circulation systems in public swimming pools. As this rule is interconnected with another rule (15A NCAC .2539), this additional rule is proposed for amendment as part of this package. This rule concerns the reduction of suction hazards in the circulation system. Changes to these two rules are proposed to enhance safety, clarify existing language and, where applicable, align the rules with current practices and standards. The proposed changes to the rules were made following consultation with industry stakeholders and staff of DHHS, Division of Public Health (DPH), Environmental Health Section (EHS) and local health departments (LHDs).

Description of Proposed Rules

A brief description of the proposed rules is provided below. The text of the proposed rules can be found in the **Appendix**.

Rule .2518 sets out requirements for circulation systems in public swimming pools. This includes requirements for water turnover and flow rates, water piping, water filtering, water vacuum cleaning, pumps, water return inlets, drains, overflow systems, and equalizer lines. Rule .2539 sets out additional requirements to reduce the risk of suction hazards and bather entrapment. This includes the posting of warnings, requirements for submerged suction outlets, methods for preventing bather entrapment, documentation requirements to verify suction outlet safety compliance, and drain cover integrity.

Both .2518 and .2539 contain references to national standards for swimming pools, including pool equipment (NSF Standard 50), suction outlets (ANSI/APSP/ICC-16), and suction entrapment avoidance (ANSI/PHTA/ICC-7). The names and dates of these standards have been updated in the proposed rules, but no impact is anticipated, as these standards are subsequent editions of currently incorporated standards.

Other changes proposed in the readoption of rule .2518 clarify existing language and align with current practices and standards for water circulation. In aggregate, these changes impose a less stringent burden on regulated persons. As such, in accordance with G.S. 150B-21.3A(d)(2), no fiscal analysis is required for these changes. The changes include the following:

- In paragraph (d), a new requirement was added for pools constructed after the readoption effective date to use plastic piping. Based on the experience of EHS staff, the industry is already only using plastic piping in new pools, as plastic is less expensive and easier to maintain than other options (steel, copper).
- In paragraph (f), new flexibility was added to allow portable vacuum equipment to be used. This may allow for cost savings, as it would permit a pool owner to replace a broken built-in vacuum with a portable vacuum, rather than repair it.
- In paragraph (g), the language has been clarified to require that flow meters measure in gallons per minute (eliminating an option for liters per minute). Based on the experience of EHS staff, meters measuring in liters are very uncommon, so any impact is expected to be minimal.
- In paragraph (h), a new, more lenient standard was added to accommodate variable speed pumps that do not meet the total dynamic head of 65 feet of water.
- In paragraph (l), new flexibility was added to allow for disablement rather than removal of skimmer equalizer lines in circumstances where the owner is not able to find covers that accommodate the flow rate.

Other changes proposed in the amendment of Rule. 2539 clarify existing language and align with current practices and standards for reduction of suction hazards. There are two changes to this rule that are anticipated to produce a fiscal impact to regulated persons.

First, when a safety vacuum release system (SVRS) is used as a secondary method of bather entrapment, the operator of the swimming pool will now be required to test the system using the methodology and at the frequency recommended by the manufacturer. The operator will be required to keep a written record of these test results along with other written records already required by Rule .2535(11). A SVRS installed or replaced after the effective date of the amended rule will also be required to have a shut off valve, if recommended by the manufacturer.

Second, systems that require a flow reduction to comply with safety requirements (for example, systems utilizing a pump with the capacity to exceed the safe flow rating of utilized drain covers) will be required to have a flow meter on return water lines that shows the water flow does not exceed the drain cover ratings or, alternatively, a sealed statement from a Registered Design Professional (RPD) showing the calculations used to justify the reduction. There is also a requirement for photographs of gauges to be provided with permit application documentation.

The impact of these changes to rule .2539 are discussed further in the impact analysis section.

Impact analysis

These updates are anticipated to have a minimal impact on state government, local government, and the private sector.

State Government Impact

The proposed rules are expected to have a small impact on state government. The proposed rule language establishes requirements that largely mirror existing standards and practices, but there will need to be some training provided by state staff to registered environmental health specialist (REHS) staff at LHDs.

The impact on state government is expected to consist of providing training on the updated rules to registered environmental health specialists ("REHSs") at local health departments. Under G.S. 130A-4, REHSs employed by local health departments ("local REHSs") are delegated authority to operate as authorized agents of the Department in administering and enforcing certain environmental health laws. One area in which local REHSs carry out this work is by permitting and conducting inspections of public swimming pools in accordance with these rules. Training for these local REHSs will be conducted by REHSs who are employed by the NCDHHS, Division of Public Health, Environmental Health Section ("state REHSs"). The state REHSs provide oversight, technical assistance, and training on a regular basis to the local REHSs at regional and district education meetings. State REHS staff will develop and provide training on the updated rules to local REHSs.

The average annual salary for the state REHS staff that will be involved in the development and delivery of training is $65,086. Using this figure, as well as an estimate of the value of fringe benefits, it is calculated that the hourly rate of a state REHS staff member is $43.23, as set out in Table 1.

Table 1: Average Hourly Pay Rate for State REHS

Salary and Fringe Benefits[1]		
Salary/Benefit	% of Salary	Total Value
Salary	100	$65,086
FICA	7.65	$4,979.07
Retirement, Death, and Disability Benefit	19.70	$12,821.91

[1] The benefits listed were identified using the North Carolina Office of State Human Resources "Total Compensation Calculator," which is available at https://oshr.nc.gov/state-employee-resources/classification-compensation/total-compensation-calculator.

Health Insurance	10.81	$7,035.78
Hourly Rate Calculation		
Total Salary + Fringe	Hours Worked / Year	Hourly REHS Rate
$77,995.62	2080	$43.23

Based on State REHS familiarity with the subject matter and experience with similar training, it is expected that one state REHS will spend approximately 2 hours total (a one-time effort) developing training materials on the updated rules. The regional education meetings where state REHSs will present the training are regularly scheduled events and will not be convened solely for the purpose of providing training on the updated rules.

Given that there are a small number of substantial changes to these rules, it is anticipated that each local REHS will need just 1 hour of training on the updated rules to become proficient in their administration. The presentation of the training at each of four regularly scheduled regional meetings will amount to a total of 4 hours of state REHS time (a one-time effort). The training is expected to be held virtually and will therefore not require travel or overnight accommodation.

As demonstrated by the calculations in Table 2 below, the total cost to the state for these rule changes is estimated as a one-time opportunity cost of $259.38. The time spent by state REHSs is expected to be an opportunity cost, as it is not anticipated that the State will hire any additional staff to complete this work.

Table 2: Estimated Impact on State Government (Opportunity Costs)

State REHS Staff Time Spent on Training Development (one time)		
Number of Hours to Complete	REHS Hourly Rate	Cost to State Government
2	$43.23	$86.46
State REHS Staff Time Spent Delivering Training		
Number of Hours to Complete	REHS Hourly Rate	Cost to State Government
4 (1hrs. x 4 meetings)	$43.23	$172.92

TOTAL ESTIMATED STATE GOVERNMENT IMPACT……$259.38

Local Government Impact

The proposed rules are expected to have a small impact on local government. Local health departments will be responsible for ensuring that their local REHS staff receive training on the updated rules by attending the trainings offered by the state REHSs. Local REHSs will also be responsible for implementing the rules. The average salary for a local REHS in North Carolina is estimated to be $50,038.46.[2] Using this figure, as well as an estimate of the value of fringe benefits, it is calculated that the hourly rate of a local REHS is $33.25.

[2] The average REHS salary was estimated using the UNC School of Government's County Salary Survey, for which 2021 data is the most recently available information, and which is available at:https://www.sog.unc.edu/publications/reports/county-salaries-north-carolina-2021.

Table 3: Average Hourly Pay Rate for Local REHS

Salary and Fringe Benefits[3]		
Salary/Benefit	% of Salary	Total Value
Salary	100	$50,038.46
All Benefits	38.2	$19,114.69
Hourly Rate Calculation		
Total Salary + Fringe	Hours Worked / Year	Hourly REHS Rate
$69,153.15	2080	$33.25

As noted in the previous section, it is anticipated that one training on the updated rules will last 1 hour. By attending the training, local REHS staff will receive continuing education credits toward their yearly requirement for REHS credentialing. The North Carolina Board of REHSs requires local health department environmental health staff members to maintain a minimum number of continuing education training hours per year to maintain their status as REHSs. The training is anticipated to be approved by the Board and, if approved, will count toward local REHS staffs' educational requirements. Mileage is not included as a cost because travel is expected to be unnecessary, as trainings will be held virtually. Similarly, costs for printed materials are not included because the new rules will be made available online at no cost. There are approximately 800 REHSs employed by North Carolina's 86 local health departments. Not all of these local REHSs work in the pools program, but for simplicity this analysis calculates what the opportunity cost would be if all local REHSs received the 1 hour of training.

As demonstrated by the calculations in Table 4 below, if all 800 REHSs receive the training, the total cost for this one-time training to local government REHS staff will amount to $26,600.00. It is expected that these costs will be opportunity costs, as participating in training is a regular part of local REHS staff responsibilities, and it is not expected that local health departments will hire additional staff to do this work. The number of REHSs that work in the pools program is likely much lower than 800; as such, the total opportunity cost is likely to be much lower. It is challenging to know how this total cost to local government will be distributed across North Carolina's 86 local health departments, as they employ varying numbers of REHS staff.

Table 4: Estimated One-Time Maximum Impact on Local Government (Opportunity Costs)

Training for Local REHSs			
Number of Hours to Complete Training	REHS Hourly Rate	Maximum Number of REHS to Receive Training	One-Time Cost to Local Government
1	$33.25	800	$26,600.00
TOTAL ESTIMATED LOCAL GOVERNMENT IMPACT …… $26,600.00*			

[3] The value of benefits was identified using the U.S. Bureau of Labor Statistics' latest available figures from March 2023 on employer costs for employee compensation for state and local government workers, which is available at: https://www.bls.gov/news.release/ecec.t03.htm.

***T**he actual number of REHSs that work in the pools program is likely lower than 800; as such, this is likely an overestimate of the total local government impact.

No other costs for local health departments are anticipated. However, it is anticipated that a change to SVRS requirements discussed below may result in a time savings, and thereby an opportunity cost savings for local health departments. This is discussed further in the private sector impact section.

Private Sector Impact

The two proposed changes to Rule. 2539 discussed above are anticipated to have an impact on the private sector.

SVRS Requirements

First, there is an impact from the new requirements in paragraph (c)(1) associated with use of SVRS as a secondary method of bather entrapment. These new requirements apply only to public swimming pools that have a single main drain or submerged outlet that is not an unblockable drain or that have multiple outlets on the same plane that are separated by less than three feet and that choose a SVRS system as a secondary method to prevent bather entrapment. Based on the experience of EHS staff, it is estimated that fewer than 10% of the approximately 17,000 public swimming pools in NC are required to implement a secondary method and only a subset of those will choose this method, so only a small number of pools in the state are expected to be impacted.

The first new SVRS requirement is that the operator of the pool test the SVRS using the methodology and at the frequency recommended by the manufacturer and keep a record of the results. It is anticipated that currently few operators conduct these tests and most do not record their results. Recommended SVRS testing cadences vary widely and could be monthly, quarterly, or yearly, as examples. Based on EHS experience, it is estimated that it will take the operator approximately 10 minutes to perform the test and an additional 5 minutes to record the results. Written results will be kept with other written records currently required to be maintained under Rule .2535(11). Maintaining written records is not anticipated to require additional expense.

Testing SVRS systems is important for the protection of the public. If the SVRS fails to operate during entrapment, it can lead to drowning or a severe injury, including profound brain damage. In addition, documentation of prior tests is important if there is a death, injury, or product recall. The devices have moving parts which may become inoperable if left for long periods of time without testing.

The second new SVRS requirement is that an SVRS installed or replaced after the effective date of the rule will be required to have a shut off valve for testing, if recommended by the manufacturer. Based on EHS experience, valves start at a cost of approximately $15-$75, depending on size. Installation costs vary, but this is anticipated to be a quick service call. The owner could also select a SVRS which does not require the installation of a valve.

It is anticipated that having a shut off valve on systems where it is recommended by the manufacturer will save both the pool operator and the REHS inspector time when running a test of those systems. The SVRS operates by sensing an abrupt change in water pressure, and it can be challenging to simulate a suction

entrapment without a shut off valve. In those circumstances, it is necessary to maneuver a rubber mat or similar item onto the drain cover to impede flow, which takes time. A shut off valve would allow completion of the test in a fraction of the time.

Flow Reduction

Secondly, there is an impact to the new requirements in paragraph (d)(1) for flow reduction. These new requirements apply only to public swimming pools that require a flow reduction to comply with safety requirements. A flow reduction is needed when a pool has a pump that exceeds the capacity of the safe flow rating of its drain covers. In this circumstance, owners are required to show that the flow has been reduced to at or below the safe flow rating of the covers.

To demonstrate this, it is necessary for the pool to have a flow meter on all return water lines confirming the flow rate. This is especially important as more powerful, variable speed pumps have come on the market. Public swimming pools are already required to have flow meters on all filtered water lines. This expands the requirement to all return water lines. In practice, it is anticipated that this new requirement will only impact public swimming pools with moving water features or hydrotherapy that have additional return water lines, a small percentage of overall pools. Based on EHS experience, flow meter costs start below $100 and rarely exceed $300 for most piping sizes, but vary depending on flow meter type, style, and pipe size. Installation costs also vary; however, this should be a quick service call. It is anticipated that this is a much lower cost than the alternative options of replacing drain covers or securing a sealed statement from an RPD, which we do not anticipate pool owners will use, and provides greater flexibility than the current rule language.

In addition, the rule clarifies that photographic documentation of these gauges is required to verify flow reduction and secure a permit. It is anticipated that this will require minimal time and cost as photographs may be taken and submitted electronically.

Summary

Overall, the proposed changes in these rules are intended to clarify existing language, align with current practices and standards, and enhance safety. The rule package is anticipated to have a minimal impact on State government, local government, and the private sector. As rule .2518 is a readoption and the proposed changes impose a less stringent burden on regulated persons, a fiscal analysis is not required. However, the cost of training on this rule has been folded in with rule .2539 in the state and local impact sections. In addition, new requirements in rule .2539 for SVRS and flow reduction are anticipated to have a private sector impact.

For state government, the anticipated impact of the proposed changes to the rules will arise from staff time spent developing and delivering trainings, which is estimated to be $259.38 (one-time opportunity cost). For local government, the anticipated impact of the proposed changes to the rules will arise from staff time spent attending trainings, which is conservatively estimated to total less than $26,600 (one-time opportunity cost, spread across the state). There may also be savings to local health departments from changes to SVRS requirements that are anticipated to decrease inspection times in a small number of pools. The impacts to the private sector are challenging to quantify, but small costs are expected to arise from new SVRS testing requirements and the installation of a shut off valve, where indicated by the manufacturer, as well as installation of flow meters in a small number of pools and submission of photographic documentation to support flow reduction. However, anticipated costs are expected to be more than offset by gains in safety and protection of the public's health.

Appendix:

SECTION .2500 - PUBLIC SWIMMING POOLS

15A NCAC 18A .2518 CIRCULATION SYSTEM

(a) Public swimming pools ~~Pools~~ shall be equipped with a water circulation system.

(b) The water ~~capacity of the~~ circulation system shall ~~be sufficient to clarify and disinfect~~ circulate and filter the entire volume of public swimming pool water four times or more in 24 hours. The water circulation system shall be operated 24 hours per day during the operating dates set out in the permit. ~~season.~~

(c) The water circulation system piping shall be designed and installed ~~with the necessary valves and pipes~~ so that the flow from the public swimming pool shall ~~can~~ be from main drains or the surface overflow system. If both main drains and a surface overflow system are used, the ~~The~~ water circulation system piping shall be designed such that the flow of water from the public swimming pool is ~~can be~~ simultaneous from the surface overflow system and the main drains. Skimmer piping constructed after May 1, 2010 shall be sized to handle ~~the maximum flow rate for the required number of skimmers, but in no case less than~~ 100 percent of the ~~design~~ flow ~~rate.~~ rate determined by the Registered Design Professional in the pool design. Perimeter overflow system piping constructed after May 1, 2010 shall be sized to handle 100 percent of the ~~design~~ flow ~~rate.~~ rate determined by the Registered Design Professional in the pool design. ~~The main~~ Main drain piping constructed after May 1, 2010 shall be sized to handle 100 percent of the ~~design~~ flow ~~rate.~~ rate determined by the Registered Design Professional in the pool design.

(d) Piping shall be designed ~~to reduce friction losses to a minimum and~~ to carry ~~the required quantity of~~ water at a maximum velocity not to exceed six feet per second for suction piping and not to exceed 10 feet per second for discharge ~~piping~~ piping, except for copper pipe where the velocity shall not exceed eight feet per second for discharge piping. ~~second.~~ Piping shall be of non-toxic material ~~material, resistant to corrosion,~~ and free of water leaks. ~~able to withstand operating pressures.~~ ~~If plastic~~ Public swimming pools constructed after the effective date of this Rule shall use plastic pipe made of ~~is used,~~ a minimum of Schedule 40 PVC. ~~PVC is required.~~ Flexible pipe shall not be ~~used~~ used, except that flexible PVC hoses that meet the requirements of NSF/ANSI/CAN ~~NSF~~ Standard 50 Equipment and Chemicals for Swimming Pools, Spas, Hot Tubs, and Other Recreational Water Facilities, incorporated by reference, including any subsequent amendments or editions, and available at http://webstore.ansi.org/ at a cost of five hundred eighty dollars (hereinafter referred to as "NSF Standard 50"), may be used when affixed to spa shells and ~~where~~ rigid pipes do not provide the necessary angles to connect circulation components. Exposed pipes and valves shall be identified by a color code with a legend or labels.

(e) The water circulation system shall have ~~include~~ a strainer with a basket to prevent hair, lint, and other debris from reaching the pump. ~~A~~ The owner of the public swimming pool shall keep a spare strainer basket onsite at the public swimming pool. ~~shall be provided.~~ Strainers shall be designed for use in pools ~~corrosion-resistant~~ with openings not more than ¼ inch (6.4 mm) in size that provide a free flow area at least four times the cross-section area of the pump suction line and are accessible for daily cleaning.

(f) A swimming pool shall have a vacuum cleaning system ~~shall be provided~~ to remove debris and foreign material that settles to the bottom of the swimming pool. ~~Where provided, integral~~ Integral vacuum ports shall be located on

the pool wall at least six inches and no greater than 18 inches below the water level. Skimmer vacuums may be used ~~in pools with~~ when connected to two or fewer skimmers that are isolated from the remaining circulation system piping. ~~provided the skimmer basket remains in place while the vacuum is in operation.~~ Integral vacuum cleaning systems shall have ~~be provided with~~ valves and protective caps. Integral vacuum ports constructed after May 1, 2010 shall have self-closing caps designed to be opened with a tool. Portable vacuum equipment may be used to meet the requirements of this Rule.

(g) A flow meter, ~~rate-of-flow indicator,~~ reading in ~~liters or~~ gallons per minute, shall be installed on the filtered water line. ~~line and located so that the rate of circulation is indicated.~~ The flow meter ~~indicator~~ shall measure ~~be capable of measuring~~ flows that are at least 1½ times the ~~design~~ flow ~~rate,~~ rate determined by the Registered Design Professional in the pool design and shall be accurate within 10 percent ~~per cent~~ of true flow. ~~flow, and shall be easy to read.~~ The flow meter ~~indicator~~ shall be installed in accordance with manufacturers' specifications.

(h) A public swimming pool shall have a pump or pumps ~~shall be provided~~ with capacity to recirculate the public swimming pool water four times or more in 24 ~~hours,~~ hours. The pump or pumps shall not need to be primed or ~~and shall be so located as to eliminate the need for priming. If the pump or pumps, or suction piping is located above the overflow level of the pool, the pump or pumps~~ shall be self-priming. ~~The pump or pumps shall be capable of providing a flow adequate for the backwashing of filters. Unless headloss calculations are provided by the designing engineer,~~ Any single speed pump ~~design~~ shall be capable of maintaining required water turnover based on headloss calculations provided by a professional engineer licensed under G.S. Chapter 89C or an assumed total dynamic head of 65 feet of water. Any variable speed pump shall be capable of maintaining water turnover as required by Paragraph (b) of this Rule based on a pump performance curve provided by the manufacturer and shall maintain the flow rate determined by the Registered Designed Professional in the pool design. Pumps ~~three horsepower or smaller~~ shall be certified by NSF International as meeting NSF Standard 50 ~~(NSF) listed~~ or verified by an independent third-party testing laboratory to meet ~~all applicable~~ provisions of NSF ~~NSF/ANSI~~ Standard 50 applicable to pumps. ~~which is incorporated by reference including any subsequent amendments or editions. Copies may be obtained from NSF International, P.O. Box 130140, Ann Arbor, MI 48113-0140 at a cost of one hundred fifty-five dollars ($155.00).~~ Verification conducted by an independent third-party testing laboratory shall include testing and ~~in-plant~~ quality control inspections. ~~Larger pumps for which NSF listing is not available shall be approved by the Department on a case-by-case basis.~~

(i) ~~Inlets.~~ All public swimming pools shall be equipped with water return inlets. The water return inlets shall meet the following requirements:

(1) ~~Inlets shall be provided and arranged to~~ The water return inlets shall produce a uniform circulation of water and maintain a uniform disinfectant residual throughout the ~~pool.~~ pool;

(2) ~~The number of inlets for any swimming pool shall be determined based on return water flow.~~ There shall be at least one water return inlet per 20 gallons per minute of return water flow with ~~flow. There shall be~~ a minimum of four water return inlets for any swimming ~~pool.~~ pool; and

(3) ~~Inlets~~ Water return inlets shall be located so that no part of the swimming pool is more than ~~then~~ 25 feet of horizontal distance from the nearest water return inlet.

~~(4) Provision shall be made to permit adjustment of the flow through each inlet, either with an adjustable orifice or provided with replaceable orifices to permit adjustments of the flows.~~

(j) ~~Drains.~~ Drains shall not be required in public swimming pools when an alternate method to drain the pool is provided. Public swimming pools constructed without main drains shall be designed with water return inlets positioned to return water uniformly throughout the public swimming pool. Public swimming pools constructed with main drains shall meet the following requirements:

(1) Public ~~Swimming~~ swimming pools with ~~suction~~ main drains shall be provided with ~~at least~~ one or more unblockable drains or two or more main ~~drain outlets~~ drains ~~which are~~ located at the deepest section of the pool on a horizontal plane and connected by symmetrical "T" piping. Except when unblockable drains are used, ~~Connecting~~ piping between main drains shall be sized and configured such that blocking any one drain will not result in flow through the remaining drain covers ~~cover/grates~~ exceeding the ~~cover/grate~~ manufacturer's ~~safe~~ flow rating while handling 100 percent of the maximum pump system flow. ~~The drains shall be capable of permitting the pool to be emptied completely.~~ ~~Drains~~ Dual main drains connected by "T" piping shall be spaced not more than 30 feet apart, and not more than 15 feet away from the side walls of the pool, ~~walls.~~ ~~Drains~~ Main Drains shall be separated by at least three feet measured from the centers of the drain covers or installed with one main drain on a horizontal plane and one main drain on a vertical plane. ~~cover/grates.~~ Main drains with two or more outlets with a common suction line shall not be equipped with valves that allow the outlets to be isolated. ~~This shall not preclude construction of a public swimming pool without main drains where water is introduced at the bottom of the pool and removed through a surface overflow system designed to handle 100 percent of the design flow rate. Provision shall be made to completely drain pools constructed without drains.~~ Public swimming pools constructed prior to May 1, 2010 with a single drain or multiple drains closer than three feet apart shall protect against bather entrapment with an unblockable drain cover or a secondary method of preventing bather entrapment in accordance with Rule .2539 of this Section.

(2) Drain outlets shall comply with the ANSI/APSP/ICC-16 2017 American National Standard ~~ASME/ANSI A112.19.8 2007~~ for Suction Outlet Fittings Assemblies (SOFA) for Use in ~~Swimming~~ Pools, ~~Wading Pools,~~ Spas, and Hot Tubs, ~~Tubs~~ which is hereby incorporated by ~~reference~~ reference, including any subsequent ~~amendments,~~ amendments or editions, and ~~successor standards under the Virginia Graeme Baker Pool and Spa Safety Act (15 U.S.C. 8001 et seq.). Copies~~ available at https://webstore.ansi.org/ at a cost of one hundred sixty-five dollars. ~~may be obtained from ASME, P.O. Box 2300, Fairfield, NJ 07007-2300 at a cost of fifty-three dollars ($53.00).~~

(3) Public swimming ~~pools~~ pool drains ~~constructed after May 1, 2010~~ shall comply with ~~ANSI/APSP-7 2006 American National Standard for~~ ANSI/PHTA/ICC-7 2020 American National Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins, ~~Basins~~ which is hereby incorporated by ~~reference~~ reference, including any subsequent amendments ~~and~~ or editions, and ~~editions. Copies may be obtained~~ available at

https://webstore.ansi.org at a cost of one hundred and sixty-five dollars (hereinafter referred to as "ANSI/PHTA/ICC-7"). ~~from APSP, 2111 Eisenhower Avenue, Alexandria, VA 22314 at a cost of three hundred fifty dollars ($350.00).~~

(k) ~~Surface Overflow Systems. (1) Swimming~~ Public swimming pools shall ~~be provided with~~ have a surface overflow system that is an integral part of the circulation system and that consists of a built-in-place perimeter overflow system, a pre-fabricated perimeter overflow system, or recessed automatic surface skimmers. The surface overflow system shall comply with the following:

~~(2)~~(1) ~~Whenever~~ When a public swimming pool uses a built-in-place perimeter overflow system or a pre-fabricated perimeter overflow ~~system~~ system, the public swimming pool may be designed with the operating water level, perimeter overflow system, and deck at the same elevation. The perimeter overflow system shall: ~~is provided, it shall be designed and installed as follows:~~

(A) ~~The system shall be~~ Be capable of handling 100 percent of the ~~circulation~~ flow rate determined by the Registered Design Professional in the pool design without flooding the overflow troughs; ~~troughs being flooded;~~

(B) ~~A surge capacity shall be provided either in the system or by use of~~ Be capable of handling a water surge ~~tank; and the total surge capacity shall be at least~~ equal to one gallon per square foot ~~(41L~~ or forty-one liters per square meter ~~meter)~~ of swimming pool water surface ~~area;~~ area. A surge tank may be used to meet this requirement;

(C) ~~The~~ Be capable of maintaining the water level of the swimming pool ~~shall be maintained~~ above the level of the overflow rim of the perimeter overflow ~~overflows,~~ system, except for ~~the~~ time intervals of no more ~~needed to transfer all of the water that may be in the surge capacity back into the swimming pool after a period of use; provided that this transfer time shall not be greater~~ than 20 ~~minutes;~~ minutes when water is transferred between a surge tank and the public swimming pool;

(D) ~~When installed the~~ Be constructed so the dimensional tolerance of the overflow rim shall not exceed ¼ inch (6.4 mm) as measured between the highest point and the lowest point of the overflow rim;

(E) ~~During quiescence, the overflow system shall be~~ Be capable of providing ~~continuously and automatically~~ continuous and automatic ~~a~~ skimming ~~action to~~ of the water during quiescence; ~~at the surface of the swimming pool;~~

(F) ~~The overflow troughs shall be~~ Be constructed so that the overflow troughs are installed continuously ~~completely~~ around the perimeter of the public swimming pool, except at steps, recessed ~~ladders~~ ladders, and ~~stairs;~~ stairs, or except when used in combination with recessed automatic surface skimmers; and

(G) ~~The~~ Provide a hand-hold on the exposed surfaces of the overflow trough. ~~trough shall be capable of providing a firm and safe hand-hold; and~~

~~(H) The overflow trough shall be cleanable and shall be of such configuration as to minimize accidental injury.~~

~~(3)~~(2) ~~Whenever a recessed~~ When a public swimming pool uses recessed automatic surface ~~skimmer or~~ skimmers ~~are installed, they~~ as an overflow system, the recessed automatic surface skimmers shall be designed and constructed in accordance with ~~Section 8 of~~ NSF Standard ~~#50~~ 50 requirements for water circulation system components for swimming pools, spas, or hot ~~tubs.~~ tubs and ~~Recessed automatic surface skimmers shall~~ be installed as follows:

(A) The rate of water flowing ~~flow through rate~~ through any one recessed automatic surface skimmer shall be ~~between~~ no less than 20 gallons per minute and no more than the maximum flow the skimmer is certified for under NSF Standard ~~Number~~ 50;

(B) There shall be at least one recessed automatic surface skimmer for each 400 square feet of water surface area of the swimming pool or fraction thereof;

(C) When two or more recessed automatic surface skimmers are required, they shall be ~~so~~ located ~~as to minimize interference with each other and as to insure proper and complete~~ to enable skimming of the entire swimming pool ~~pools~~ water surface; ~~and~~

(D) Skimmers shall not protrude into the water of the public swimming pool. Pools using recessed automatic ~~Automatic~~ surface ~~skimmer or~~ skimmers without a perimeter overflow system shall be installed so that the operating water level of the pool is no more than nine inches below the level of the finished deck. ~~deck level so that the deck can be used as a handhold.~~

(l) Where flooded suction on the pump is not possible to prevent cavitation and loss of prime, skimmers shall have a device or other protection to prevent air entrainment in the suction line. Skimmer equalizer lines shall be in compliance with ANSI/PHTA/ICC-7 or disabled. Skimmer ~~The inlet to the~~ equalizer ~~line~~ lines shall be disabled by plugging the line under the skimmer basket and where the equalizer pipe exits the pool shell. ~~provided with a grate.~~

~~(m) Nothing in this Section shall preclude the use of a roll-out or deck-level type of swimming pool. Such designs shall conform to the general provisions relating to surface overflow systems.~~

~~(n)~~(m) Nothing in this Section shall preclude the use of a surface overflow system that combines both a perimeter overflow system and a recessed automatic surface skimmer or ~~skimmers.~~ skimmers that meet the requirements of this Rule.

History Note: *Authority G.S. 130A-282;*
Eff. May 1, 1991;
Amended Eff. May 1, 2010; February 1, 2004; April 1, 1999; January 1, 1996; July 1, 1992.

15A NCAC 18A .2539 SUCTION HAZARD REDUCTION

(a) At all public wading pools that use a single main drain for circulation of water, signs shall be posted stating, "WARNING: To prevent serious injury do not allow children in wading pool if drain cover is broken or missing." Signs shall be in letters at least one-half inch in height and shall be posted where they are visible to people entering the wading pool. Submerged suction outlets shall be prohibited in wading pools in accordance with ANSI/PHTA/ICC-7 2020 American National Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins, which is incorporated by reference, including any subsequent amendments or editions, and available at https://webstore.ansi.org/ at a cost of one hundred and sixty five dollars (hereinafter referred to as "ANSI/PHTA/ICC-7").

(b) All submerged suction outlets in public swimming pools other than vacuum ports shall be protected by a ~~anti-entrapment~~ cover ~~cover/grates~~ in compliance with ~~ASME/ANSI A112.19.8 2007~~ ANSI/APSP/ICC-16 2017 (PA 2021) American National Standard for Suction Outlet Fitting Assemblies (SOFA) ~~Fittings~~ for Use in ~~Swimming~~ Pools, ~~Wading Pools,~~ Spas, and Hot ~~Tubs.~~ Tubs, which is hereby incorporated by reference, including any subsequent amendments or editions, and available at https://webstore.ansi.org/ at a cost of one hundred and sixty five dollars (hereinafter referred to as "ANSI/APSP/ICC-16"). All submerged suction fittings shall be installed in accordance with the manufacturer's instructions.

(c) Water pumping ~~Pumping~~ systems in public swimming pools that have a single main drain or single submerged suction outlet other than an unblockable drain, or that ~~which~~ have multiple outlets in the same plane separated by less than three ~~feet~~ feet, measured ~~at~~ from the centers of the covers ~~cover grates~~ shall have one or more secondary methods of preventing bather entrapment. Secondary methods of preventing bather entrapment include:

(1) ~~Safety~~ A safety vacuum release system which ceases operation of the water pump, reverses the circulation flow, or otherwise provides a vacuum release at the suction outlet when a blockage has been detected, that has been tested by a third party and found to conform ~~to ASME/ANSI~~ with ANSI/PHTA/ICC-7. ~~standard A112.19.17 which is incorporated by reference including any subsequent amendments or editions. Copies may be obtained from ASME, P.O. Box 2300, Fairfield, NJ 07007-2300 at a cost of forty-five dollars ($45.00);~~ The operator of the public swimming pool shall test an installed safety vacuum release system using the methodology and at the frequency recommended by the manufacturer, and the test dates and results shall be recorded in the written records required by Rule .2535(11). Safety vacuum release systems installed or replaced after the effective date of this Rule shall have a shut off valve for testing the device, if recommended by the manufacturer;

(2) A suction-limiting vent system with ~~a tamper-resistant~~ an atmospheric ~~opening;~~ opening inaccessible to the public;

(3) A gravity drainage system that utilizes a surge ~~collector~~ tank;

(4) An automatic pump shut-off system;

(5) ~~Drain disablement;~~ Disabling the submerged suction outlet; or

(6) Any other system that complies with ANSI/PHTA/ICC-7. ~~determined by the U.S. Consumer Product Safety Commission to be equally effective as, or better than the systems in Subparagraphs (1) through (5) of this Paragraph.~~

~~(c)~~(d) ~~Prior to issuance of operation permits, owners~~ Owners of all public swimming pools shall provide documentation to the Department as part of the application for an operation permit under Rule .2510(c) to verify suction outlet safety compliance. This documentation shall include:

(1) Documentation of the maximum possible flow rate for each pump suction system. This shall be the maximum pump flow shown on the manufacturer's pump performance curve except where flow reductions are justified with total dynamic head measurements or ~~calculations; and~~ calculations. Flow reduction measurement documentation shall include photographs showing the levels of all the gauges used in the public swimming pool. All systems using a flow reduction to comply with this rule shall have a flow meter on the return water line confirming that the water flow does not exceed the gallon per minute flow rating of the drain covers or a sealed statement from a Registered Design Professional showing calculations used to justify the reduction;

(2) Documentation that ~~cover/grates~~ drain covers are in compliance with ~~meeting ASME/ANSI A112.19.8 2007~~ ANSI/APSP/ICC-16 and the ~~are installed in compliance with the standard and~~ manufacturer's instructions. This includes documentation that each drain cover ~~cover/grate~~ on a single or ~~double drain~~ dual drain pump suction system is rated to meet or exceed the maximum pump system flow or the measured flow of the pumping system. ~~and that cover/grates~~ Drain covers on a ~~pump~~ submerged suction system with three or more suction outlets shall ~~are~~ together be rated to ~~always~~ meet or exceed the maximum pump system flow with one drain completely ~~blocked; and~~ blocked, unless the combined flow of all unblockable drains meet or exceed the maximum pump system flow or the measured flow of the pumping system; and

(3) Documentation that drain sumps meet the dimensional requirements specified in the drain cover ~~cover/grate~~ manufacturer's installation instructions.

~~(d)~~(e) Operators of all public swimming pools shall inspect pools daily to ensure the drain covers are ~~in~~ not missing, broken, or cracked ~~good condition~~ and are securely attached. The operator shall close the public swimming pool until missing. ~~Missing,~~ broken, or cracked suction fittings are ~~shall be~~ replaced and loose suction fittings are resecured. ~~shall be reattached before using the pool.~~

History Note: *Authority G.S. 130A-282;*
Temporary Adoption Eff. June 1, 1994 for a period of 180 days or until the permanent rule becomes effective, whichever is sooner;
Eff. October 1, 1994;
Amended Eff. May 1, 2010; January 1, 2006; February 1, 2004; April 1, 1999;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. July 20, 2019.