

Petition

Bonnie Snow and Teri Snow owners of BeeSafe Systems are Requesting Equal to or Better Than Status of the Virginia Graham Baker Act from The Consumer Product Safety Commission.



H.R. 6—303 to 309
Title XIV—Pool and Spa Safety Act

Section 1404. FEDERAL SWIMMING POOL AND SPA DRAIN COVER STANDARD
(c) PUBLIC POOLS

(1) REQUIRED EQUIPMENT

(A) IN GENERAL.—Beginning 1 year after the date of enactment of this title—
(i) Each public pool and spa in the United States shall be equipped with anti-entrapment devices or systems that comply with the ASME/ANSI A112.19.8 performance standard, or any successor standard; and (ii) each public pool and spa in the United States with a single main drain other than an unblockable drain shall be equipped, at a minimum, with 1 or more of the following devices or systems designed to prevent entrapment by pool or spa drains that meets the requirements of subparagraph (B):

(VI) OTHER SYSTEMS.—Any other system determined by the Commission to be equally effective as, or better than, the systems described in subclauses (I) through (V) of this clause at preventing or eliminating the risk of injury or death associated with pool drainage systems.



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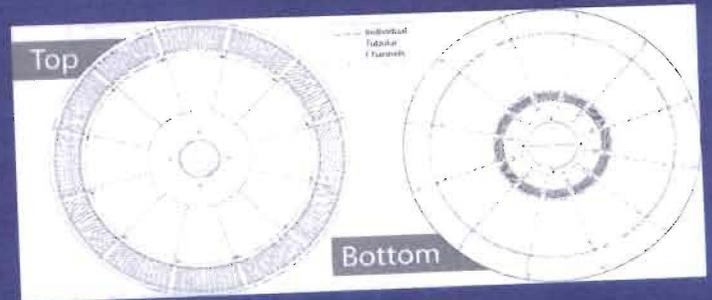
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I. Introduction

Designing the best solution to avoid all entrapment hazards.

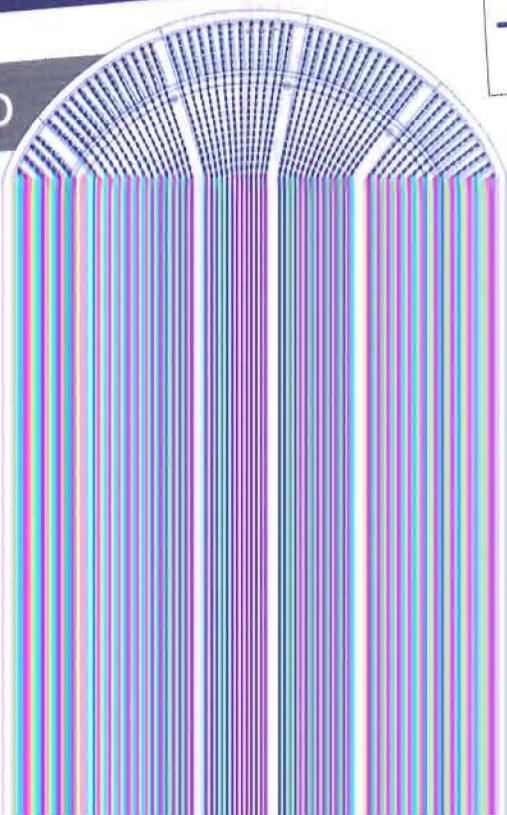


This paper covers the advantages of the BeeSafe System as well as makes comparisons to the other acceptable methods to bring pools into compliance with the Virginia Graeme Baker Pool and Spa Safety Act (VGB Act). The purpose is to present all of the necessary material to warrant action by the Commission to classify the BeeSafe System as (VI) equally effective, or better than, the systems described in subclauses (I) through (V) of this clause (VGB Act) at preventing or eliminating the risk of injury or death associated with pool drainage systems. We begin with a discussion of the most defining feature of our system.

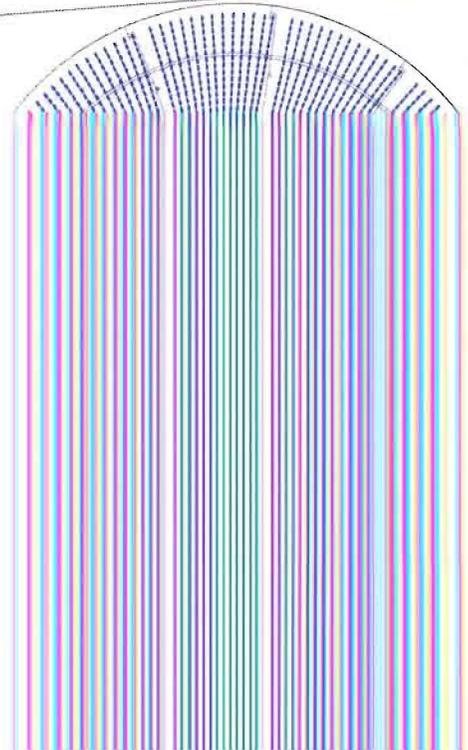


The one obvious feature of the BeeSafe System that makes it unique, and is the patented feature of our company, is the tube. We avoid entrapments with the use of many long tubes. Initially we thought of straws that water will flow through when suction is applied. We found that an abundance of tubes combine to effectively eliminate the possibility of entrapment behind a grate. By using enough tubes in a large enough configuration all forms of entrapment are addressed.

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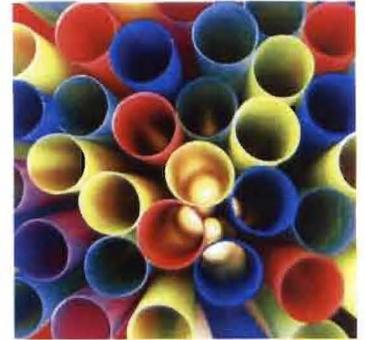


--- 156 Individual 12 Inch Tubular Channels
● open into an internal sump.

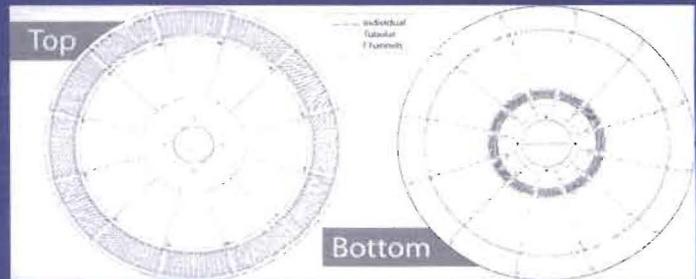


I. Introduction

Designing the best solution to avoid all entrapment hazards.

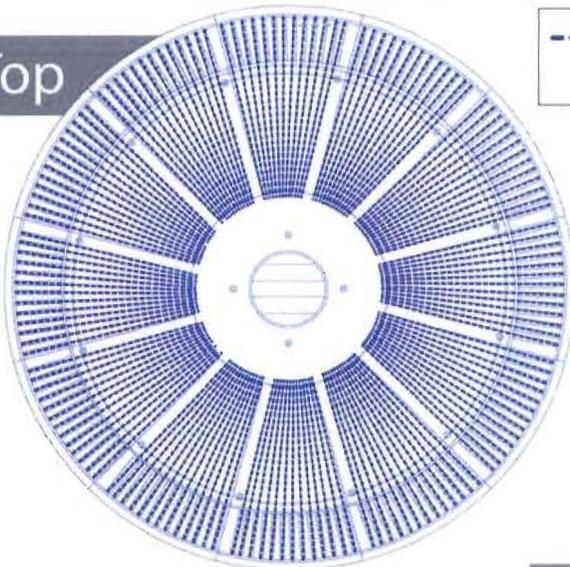


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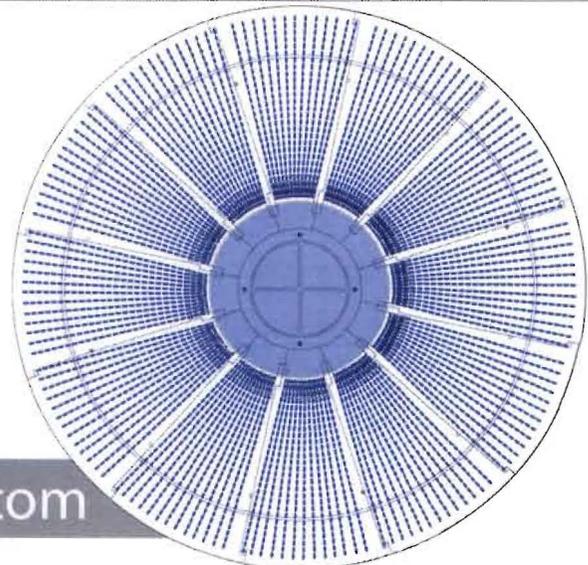
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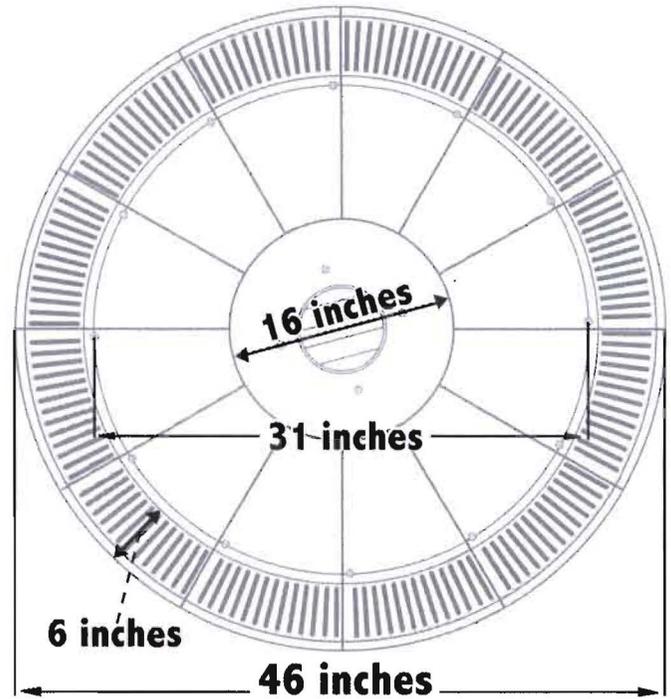
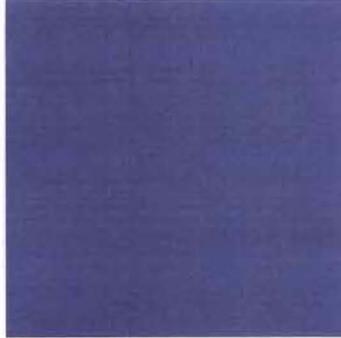
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----- **156 Individual 12 Inch Tubular Channels**
● **open into an internal sump.**

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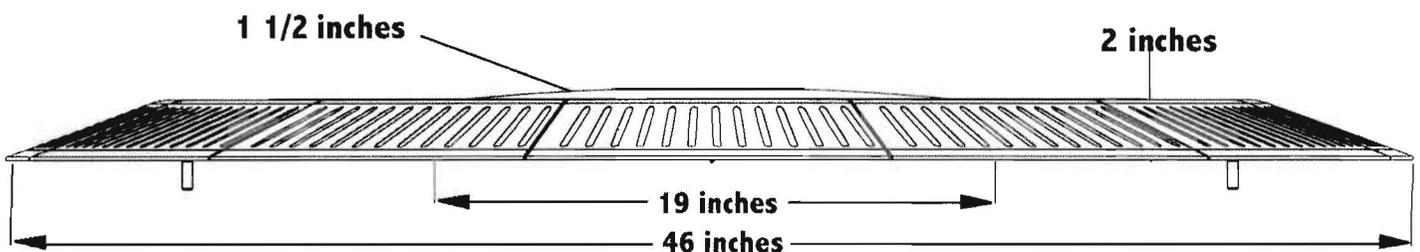


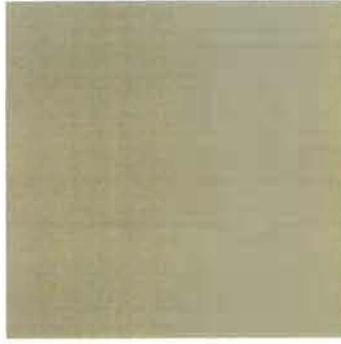
II. Background Information

A. BeeSafe Systems

BeeSafe Systems, LLP is a small company that's one and only purpose for becoming a business was and is to produce the ultimate answer to resolving the problem of entrapment that is associated with swimming pool main drains. Bonnie Snow was an Environmental Health Scientist with Utah County from 1993 to 2006 and worked as an inspector of swimming pools as well as many other inspections. Her daughter, Teri Snow worked as a graphic designer from 1995 to 2006 and she brought her talents and background to the company to

provide visual marketing of our product. Together they have developed, patented, and produced the BeeSafe System as the best possible solution for avoiding entrapment in swimming pools. Their products are large and meet the standard definition of unblockable as found in the pool industry literature and in the Virginia Graeme Baker Pool and Spa Safety Act (VGB Act). But there is so much more than just the size of these products that make them the best solution and reason why BeeSafe Systems should be considered as equally as effective as or better than either dual main drains or a single drain that is supplied with a secondary back-up system as described in the VGB Act.





B. Virginia Graeme Baker

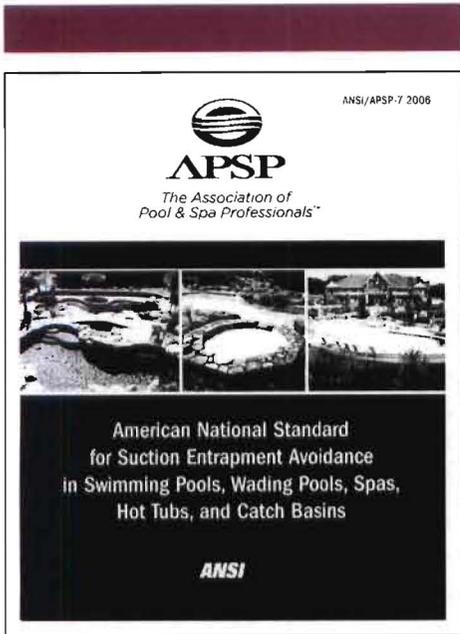
When Virginia Graeme Baker died

from an entrapment in a private spa, inspectors of swimming pools became more aware of the hazards associated with pool drains and anticipated the changes that needed to be made. There were very few products available and the pool industry was in transition to determine and develop new ways to resolve the issues. Starting with inspections in 2003 the inspector who developed the BeeSafe System started to recommend that each pool owner/operator try to find the best solution to avoid entrapment with their drains. Quickly these pool people let her know that there were no solutions available for the square openings of most of the Utah County pool drains. Additionally they let her know that the available solutions were not being recommended by the professionals at the pool stores.



The first anti-entrapment covers were introduced as anti-vortex drain covers but these proved to be equally if not more hazardous as the problem with hair entanglement increased and most of these products eventually were recalled or replaced by the companies that made them.





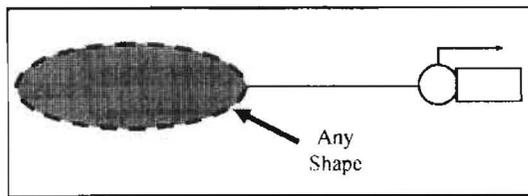
Between 2002 and 2006 a group of over 50 people who represented many companies and agencies concerned with the entrapment problem joined together to write a recommendation standard as a guideline for the development of safer drain covers. This resulted in the ANSI / APSP -7 2006 Standard that was titled: *American National Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins*. This guideline was studied carefully and the information and pictures there provided us with the inspiration for development of the BeeSafe System.

C. APSP Standard 2006



Suction Entrapment Avoidance Saves Children's Lives.

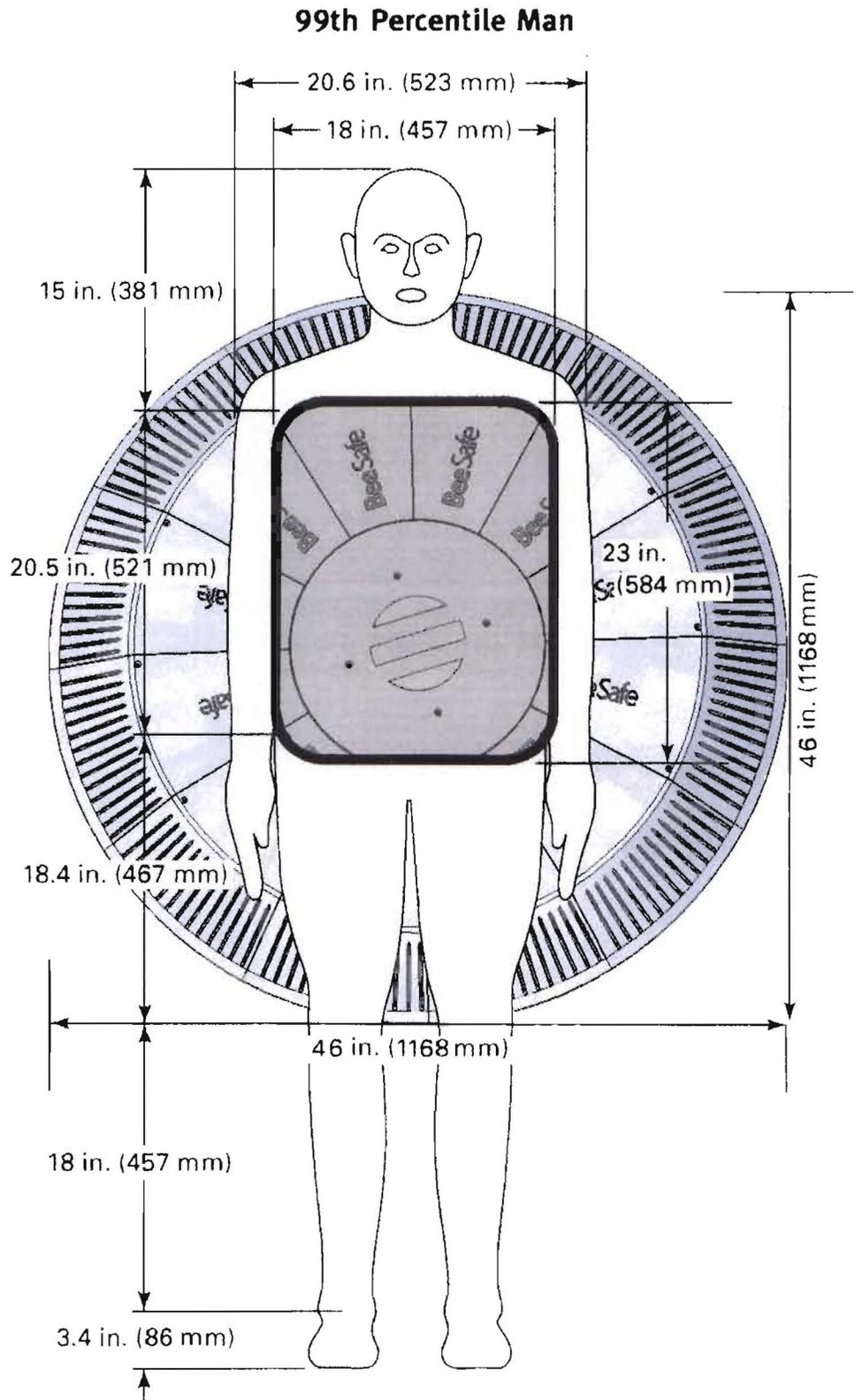
Emphasis of the guideline was on making changes in the drain cover. The cover is the component of the drain or suction outlet for a pool that comes into contact with the bather and is the point of entrapment. Small covers that can be completely covered by a bather are the most likely to be involved in entrapment accidents (especially body and evisceration accidents). The obvious best answer becomes a cover or system that greatly reduces the suction force at the surface of the drain to avoid entrapment without reducing the flow through the drain system that is necessary to keep the pool in good chemical balance and able to reduce bacterial contaminants. The guidelines led us to the designing of the BeeSafe System, a large 46 inch diameter cover that weighs over 90 pounds. The system is placed over the existing sump or other outlet system. It then address all forms of entrapment, not just body entrapment. Better than any other available solution, the BeeSafe system addresses all of the other potential hazards for suction entrapment.

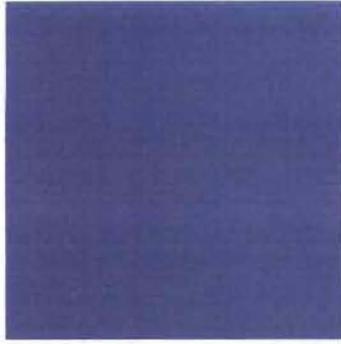
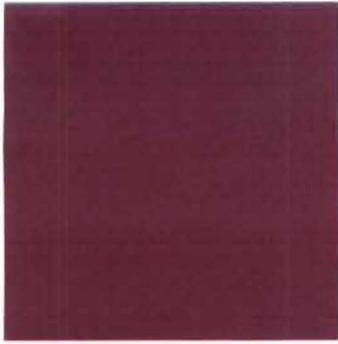


Large unblockable outlet of any shape to single pump

It is important to note that the definition specifically states covers without reference to the sump or any other component of the drain system.

After long consideration of the problem and the recommendations of the professionals, we decided that the reference to an unblockable drain would be the best possible solution. The exact wording of the guideline is found in section 5.5.2 Single unblockable outlet. (See Figure 13.) Single unblockable covers shall be of any size and shape that a representation of the torso of the 99th percentile adult male cannot sufficiently block it to the extent that it creates a body suction entrapment hazard. The torso is represented as a rectangle 18 inches x 23 inches (457 mm x 584 mm) with corners of radius 4 inches (102 mm).



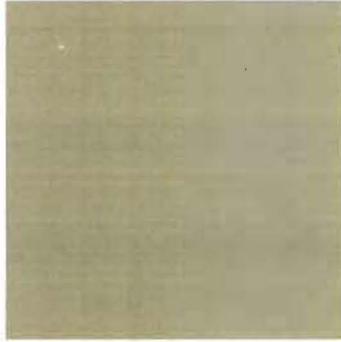


ASME A112.19.8-2007
(Revision of ASME A112.19.8-2002 (R2007) (M1904))

**Suction Fittings
 for Use in
 Swimming Pools,
 Wading Pools,
 Spas, and Hot Tubs**

AN AMERICAN NATIONAL STANDARD

The American Society of
 Mechanical Engineers



D. ASME A112.19.8-2007 +

The ASME A112.19.8-2007 Standard was the original testing standard for products to become compliant with the VGB Act. Over the past four years there have been newer versions of a-2008, b-2009 and now an APSP Standard that has been modified at least twice. With each change, there are pools that have been modified that need to make further modifications to remain in compliance. This coupled with the recall and reversal of the decision on unblockable drains has left the industry and pool owners even more confused and apprehensive about costly remodeling. Many pools across the country chose to close their pool rather than go to the expense of remodeling. This has resulted in fewer facilities for children to take swimming lessons. Home owned pools, that have been teaching facilities, now need to meet the requirements of public pools so many no longer offer lessons. When children don't learn to swim the number of drowning (entrapment or other cases of drowning) only increases.

The BeeSafe System, if considered as another option, could be used in pools that otherwise will remain closed.



III. Virginia Graeme Baker Pool and Spa Safety Act.

Congress finds the following:

- (1) Of injury-related deaths, **drowning is the second leading cause of death in children aged 1 to 14** in the United States.
- (2) In 2004, **761 children aged 14 and under died as a result of unintentional drowning.**
- (3) Adult supervision at all aquatic venues is a critical safety factor in preventing children from drowning.
- (4) Research studies show that the installation and proper use of barriers or fencing, as well as **additional layers of protection**, could substantially reduce the number of childhood residential swimming pool drowning and near drownings.



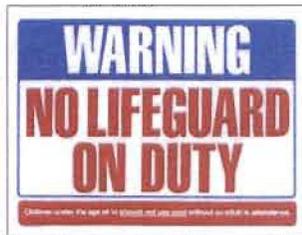
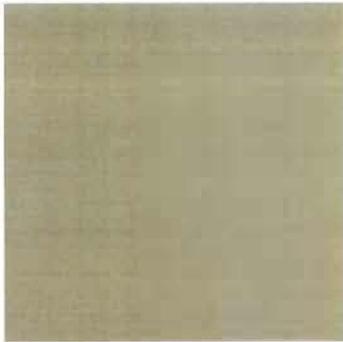
(1) REQUIRED EQUIPMENT.--

(A) IN GENERAL.—Beginning 1 year after the date of enactment of this title—

- (i) Each public pool and spa in the United States shall be equipped with anti-entrapment devices or systems that comply with the ASME/ANSI A112.19.8 performance standard, or any successor standard; and (ii) each public pool and spa in the United States with a **single main drain other than an unblockable drain** shall be equipped, at a minimum, with 1 or more of the following devices or systems designed to prevent entrapment by pool or spa drains that meets the requirements of subparagraph (B):

- (I) **SAFETY VACUUM RELEASE SYSTEM.**—A safety vacuum release system which ceases operation of H. R. 6—305 the pump, reverses the circulation flow, or otherwise provides a vacuum release at a suction outlet when a blockage is detected, that has been tested by an independent third party and found to conform to ASME/ANSI standard A112.19.7 or ASTM standard F2387.
- (II) **SUCTION-LIMITING VENT SYSTEM.**—A suction-limiting vent system with a tamper-resistant atmospheric opening.
- (III) **GRAVITY DRAINAGE SYSTEM.**—A gravity drainage system that utilizes a collector tank.
- (IV) **AUTOMATIC PUMP SHUT-OFF SYSTEM.**—An automatic pump shut-off system.
- (V) **DRAIN DISABLEMENT.**—A device or system that disables the drain.
- (VI) **OTHER SYSTEMS.**—Any other system determined by the Commission to be equally effective as, or better than, the systems described in subclauses (I) through (V) of this clause at preventing or eliminating the risk of injury or death associated with pool drainage systems.

We are asking the Commission to take action on item (VI).



A. Layers of Protection.

Only an example of fencing is mentioned in the act. There are many other layers of protection required by many state swimming pool regulations. Some examples are: self closing and self latching doors, less than 4 inch opening at the bottom of fencing, maintaining rescue equipment such as a shepherd's hook and a rope with a ring buoy, winterizing and pool closed cover barriers, appropriate warning signs, and safer drain covers. As the intent of the VGB Act is to make the drains safer, this discussion will continue with drain modification options for both existing and new pools.

As we consider the drains and the layers of protection it is also important to recognize all of the risk factors that the approved drain configurations need to address. While dual drains reduce the risk of body entrapment some, they are not a good solution alone for addressing hair and mechanical entrapments. The same is true of safety vacuum release, suction limiting vent, gravity drainage, and automatic pump shut off systems. Unless the entrapment involves a cover blockage, these systems will fail to avoid the accident. Once hair is entangled it doesn't matter if the pump remains on or off, the entrapment has occurred. In order to compare all of the systems and to show that the BeeSafe System is equal to or better than these at resolving entrapment, a short discussion of the risk factors or types of entrapment that have been identified by CPSC and the pool industry is covered here.

B. Identification of how we resolve all 5 types of entrapment

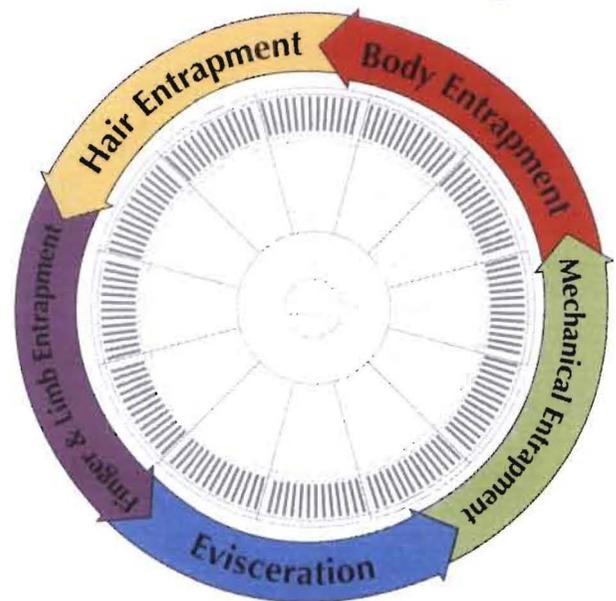
Body Entrapment - If a body comes into contact with a drain cover a body entrapment might occur. This is the most often discussed type of entrapment and the one that most of the compliant products have addressed. Obviously a small drain cover is much easier to cover with a body than a large drain cover. Both size and shape of the BeeSafe system make it the best choice for resolving body entrapment.



Hair Entrapment – It is estimated that hair entrapment is involved in more than half of the suction entrapment accidents. Very few of the available covers do much if anything to avoid this type of entrapment. What happens is that hair is pulled through the cover openings and the suction force will cause the various hairs to entangle with others. If hair can enter through the grate of a cover and become entangled then the cover has not addressed this form of entrapment. As the bather moves away from the drain the hairs that are entangled will become knotted behind the grate and the swimmer is trapped. The tubes of the BeeSafe System offer the best protection against hair entrapment.



Limb & Finger Entrapment – Finger and limb entrapment is resolved by limiting the size of the opening to less than 1/4" in diameter. Even a small child's finger or toe will not fit into the openings at the surface of the BeeSafe System. Limb entrapment may happen only if a cover is missing. Starting with the guidelines and in each and every standard for suction entrapment avoidance is the overriding conclusion that there is no "back-up" for a missing suction outlet cover.



Mechanical Entrapment – There have been instances where a bather had jewelry or in some cases a dog tag on a chain that got entangled in or behind the grate of a drain cover and resulted in an entrapment accident. Limiting the size of the opening in our system was one method of resolving this type of entrapment. The length of the tubes again is the ultimate best solution. Other mechanical entrapments of clothing or other items were also considered and the BeeSafe System was designed to address all of these.



Evisceration - The Abigail Taylor accident happened because a drain cover was missing. If a child is able to sit on an open drain and create a complete blockage of the line, the force is so great that evisceration quickly results. This action is so swift that an SVRS system or pump shut off will not react quick enough to avoid the disaster. We came up with a permanent installation to greatly reduce this risk.



C. Drain Compliance Options

1. Dual Drains

While this is not mentioned in the VGB Act, it is accepted by the pool industry that as long as the drain has more than a single main drain with compliant covers then the pool is in compliance with the law. No one seems to question if this is really a good way to solve entrapment. Obvious problems of dual drains are differential hold down force, inconsistency balance and double entrapments. In addition, retrofitting an older pool with dual drains is very costly and may cause damage to the integrity of the pool floor.

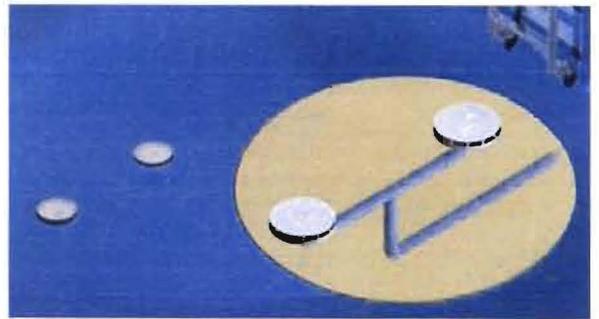
a. Differential hold down force.

Differential hold down force refers to the force holding down an object blocking only one drain in a dual drain swimming pool. The force is created due to the restriction of flow created by restrictions on the unblocked drain. One example would be unequal length of lines. If lines are of different lengths then one will have more hold down force than the other. Under the wrong circumstance, the hold down force on one side of a dual drain system can exceed 200 lbs, even though the other drain is unblocked!

b. Balance

In order for a dual drain to function properly the lines must first be installed in complete balance. The lines branching from the main outlet line must be in vertical and horizontal balance as well as many other factors. Once installed the system must remain balanced.

It has been noticed in some of the pools that have installed dual drains in areas with a lot of sand that the drains quickly become unbalanced. If one of the drains starts to fill with sand, the flow will no longer be 50/50 between the drains. The one with sand will then continue to build up more sand as the flow to pull sand through the drain will be less and less on this arm of the dual system. Eventually the build-up of sand will leave the other branch of the drain with the same potential for suction entrapment as a single main drain.





c. Failure to address all types of Entrapment

As previously mentioned, dual drains are no better than the compliant cover used at resolving hair, mechanical, and finger/limb entrapments.

d. Double Entrapments

Consider the possibility of two children making a game of racing to the two drains of a dual system. Did you ever play a game where you dropped two pennies into the pool and then swimmers raced to retrieve them? This poses an entrapment hazard as everything is pulled towards the drain.

Dual Drains at the lowest part of the pool will pull the pennies toward the covers. This increases the possibility of two swimmers simultaneously experiencing any of the possible (body, hair, finger, mechanical) entrapments. Which do you see as the better solution: dual drains or the BeeSafe System?

e. Damage to the integrity of the pool floor.

When dual drains are installed into an existing pool the floor must be cut to modify the drain line. As the older concrete is probably of a different mix than the newer concrete mixes used in swimming pools, the possibility of a crack line developing exists. When this happens water will slowly erode the concrete and permanent damage to the pool may result.

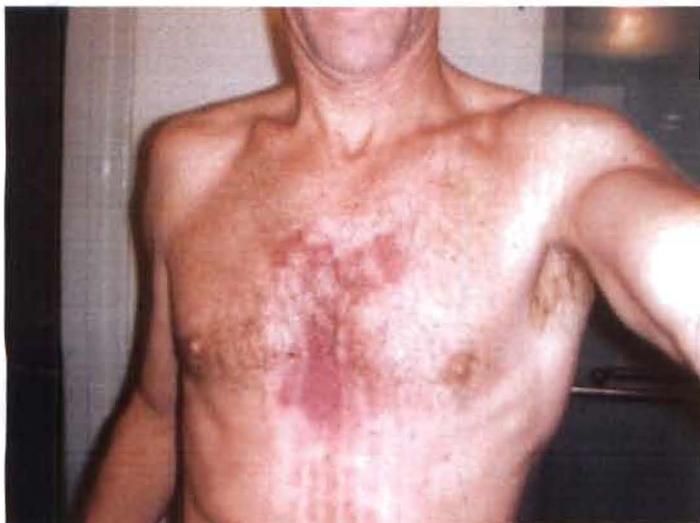
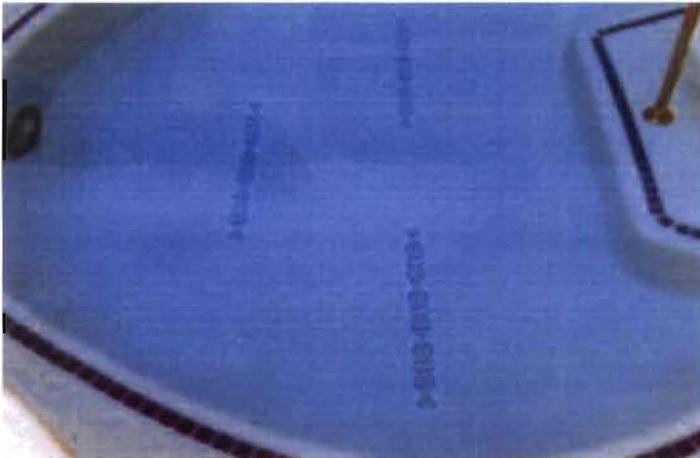


2. Unblockable Drains

The definition of an Unblockable drain led to the development of many products that again may address only one or two of the types of entrapment. Under the first interpretation of an unblockable drain, the cover simply had to be larger than the body blocking element and allow for flow when the element was placed on the drain cover. Channel drains have been classified here as well as square, rectangular and circular drain covers of large size. If the large cover just provides grate openings then hair, mechanical and finger entrapment may still be hazards not addressed.

Tim McIntyre made the news as he wanted to see if the new VGB compliant covers in his condo complex pool were in fact safer than the old drains. While he avoided drowning, the pictures show the result.

Just being large in size is not enough to solve the issues of all types of entrapment.



3. Single Drains with additional protection

For the sake of this paper, only SVRS and turn-off switches will be considered for comparison. This is because the other mentioned systems (suction limiting vent and gravity drainage) in the VGB Act, will have been existing rather than added for retrofit, and are both great systems to be used with the BeeSafe System. As we discuss the advantages of the BeeSafe System it will become evident that SVRS and turn off switches will not give any additional protection beyond that which is built into the BeeSafe System.



One unique feature that makes the BeeSafe System equal to or better than an SVRS or back-up breaker is the emptying of the tubes if they become blocked. With such a large number of tubes, water will be flowing through all tubes that are not blocked. Any that become blocked will simply empty the water into the built in sump and any suction at the surface will be released when this happens. This action can be compared to a hydraulic switch. The action is as fast as or faster than any of the breaker secondary systems currently on the market. Because of this benefit of the BeeSafe System there would be no advantage gained by the addition of an SVRS device. Both NSF and IAPMO testing showed that BeeSafe Systems Model One can handle over 6,000 gpm with no body entrapment.

Turn-off switches really only protect against body entrapment. If hair or jewelry gets stuck there most likely will not be a detectable drop in flow until the struggling swimmer collapses onto the drain. Limb entrapment only happens if a cover is missing and the appendage is not likely to come out, once it is trapped, even if the pump turns off. Evisceration is so rapid that a turn-off switch doesn't avoid this entrapment either. BeeSafe Systems really does address all five types of entrapment and will be discussed more completely in the following sections. The BeeSafe System is better alone than with an SVRS or back-up breaker.

IV. What must be done to bring a pool into compliance with the Virginia Graeme Baker Pool and Spa Safety Act.

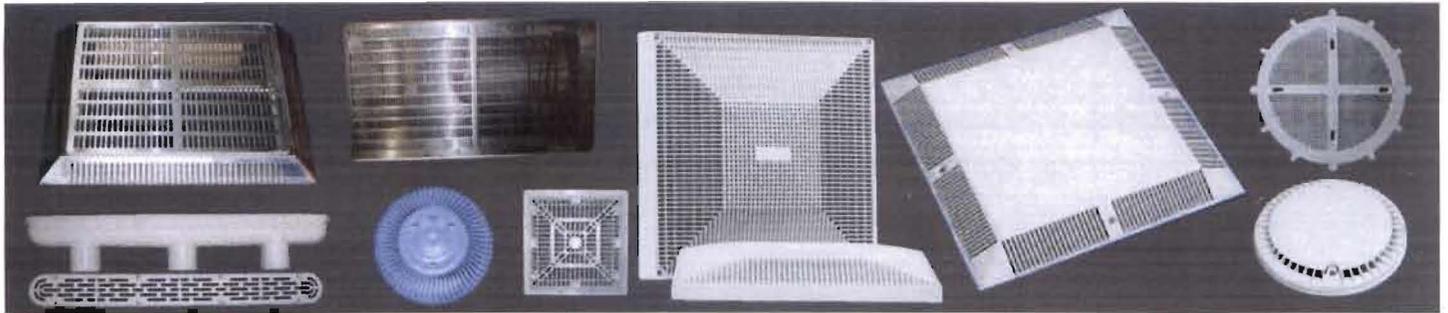


A. Evaluation of the existing pool and outlets.

Every pool has had to evaluate their existing drain systems to determine how they would comply with the VGB Act. There is no one best solution for all pools. Some were built with square outlets, some with round. Some covers were as small as 2-4" covers similar to a standard floor drain cover, some 6-8" round covers, some 12-24" square covers and many field built variations of different sizes and shapes of large unblockable covers etc. All of these needed to be replaced with covers compliant with the ASME A112.19.8-2007 or a newer standard to be compliant with the VGB Act.

The material that the pool is made of becomes a factor in the evaluation, as some will not be able to remodel the bottom without serious damage to the pool floor. While a concrete pool at great cost can be modified by cutting into the floor for adding additional outlets to a drain line, an aluminum bottom or vinyl pool cannot be modified in this manner.

Cost to become compliant was probably the most important factor in most pool evaluations. The National Multi Housing Council/ National Apartment Association surveyed and found the average cost associated with the new VGB drain covers was \$6,539 per respondent, additionally they found that the May 2011 drain cover recall cost additionally \$2,235 per respondent. They project that the revocation of "Unblockable drain" interpretation estimates range from \$1,000 to \$70,000 per respondent. If at all possible most owner/operators wanted to become compliant without a total remodel of the pool.



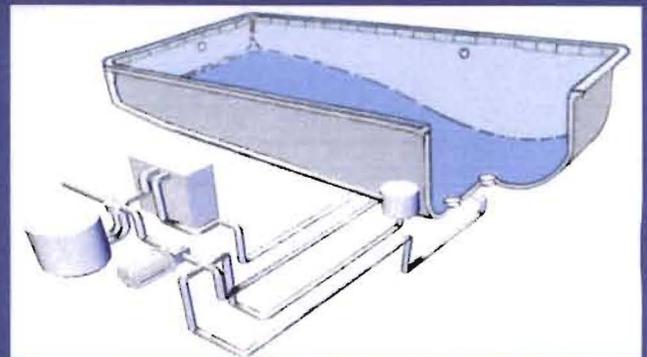
B. Determining the right size drain cover for a pool.

The main factor in finding the right cover has to do with the flow rate of the pool. Flow rate is determined by the volume of the pool and the required turn-over rate. Most low to moderate usage pools are required to have a turn-over rate of 8 hours (three times per day) while high usage pools must maintain a six hour (4 times per day) turn-over rate. This means that theoretically all of the water in the pool will be recycled through the drain system every 6 or 8 hours. Some older pools were built to handle an 8 hour turn-over and later health regulations required the pools to increase the flow to handle a 6 hour turn-over. This increases the volume of water that is re-circulating through the drain and results in an increase in the suction at the surface. In some cases this has been the reason for suction entrapment.

Flow rate for the pool in most cases can be found on original plans that have been kept by health departments. When changes in regulations have dictated changes in flow rates these should have been available to the inspector and the operator. Many pool operators were unable to obtain records, but did calculate the pool volume and subsequently calculated the flow rate for their pool.

One of the difficulties for inspectors being able to tell if the new compliant cover is adequate, has been the lack of uniformity and sometimes complete lack of original pool plans. While the flow rate may meet the calculation made for the pool volume, the system may not have been built to handle this flow.

Generally speaking, a large size pool will need a high volume drain cover. With the change in interpretation of Unblockable Drains, many large pools cannot find single drain covers that are capable of handling the flow. The recall of over a million drain covers indicates that there were many covers made for low volume pools, but inadequate testing resulted in pools installing inadequate covers. Many smaller pools affected by the recall have to resort to costly remodeling or the closing of their pools.

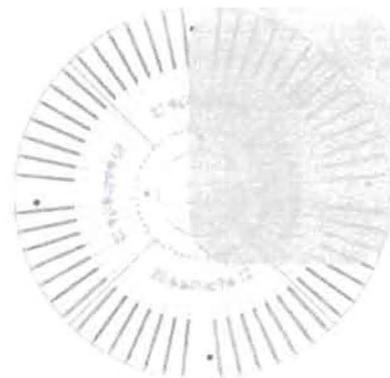
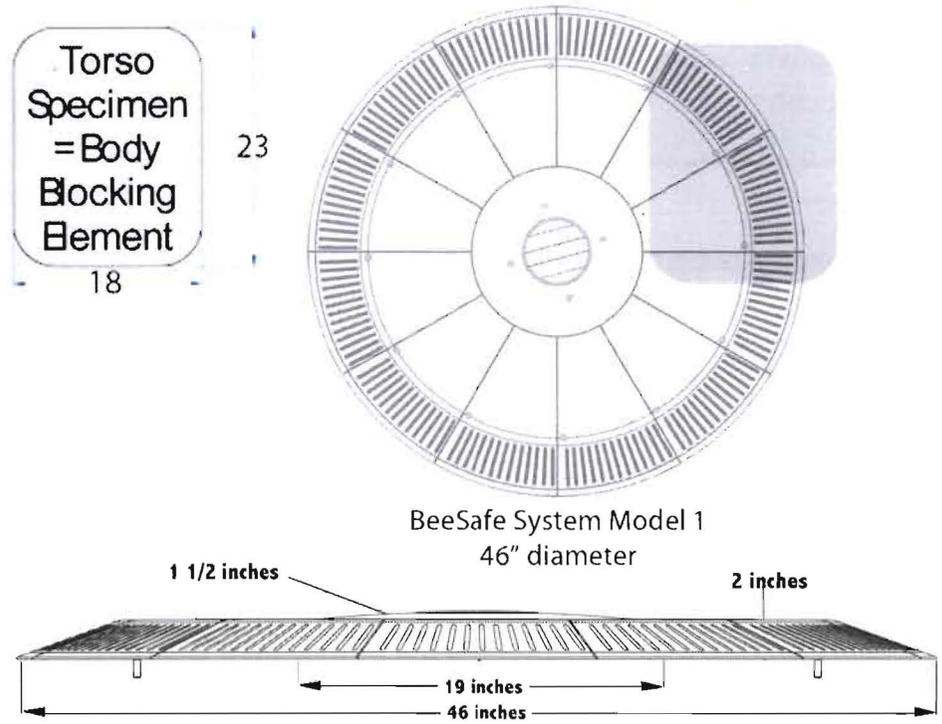


V. Designing of the BeeSafe System.

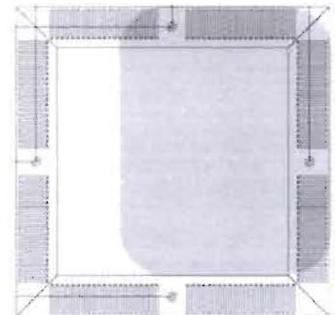
Simply a Better Answer to Suction Entrapment!

If a cover could be made that could not be blocked by a body then entrapment could not happen. This was and is the goal of all VGB compliant products. Most have not made a larger product but have used various methods to raise the grate to utilize laminar flow or flow of water from the sides rather than the top to reduce the amount of suction force. The body testing form is of a hard foam material but skin is flexible and can mold over the slightly raised covers. If the drain can be completely covered or blocked by a bather's body then suction entrapment will happen.

The BeeSafe System is a much better solution for body entrapment than any of the smaller covers that have been developed. In fact it is better than any other large unblockable product



BeeSafe System Model 2
34" diameter



AEGIS
Anti-Entrapment Shield
30x30"



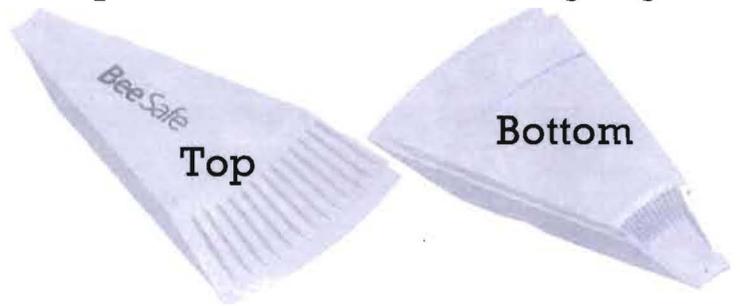
Channel Drain
3x31"



Small Drains
6 - 9"

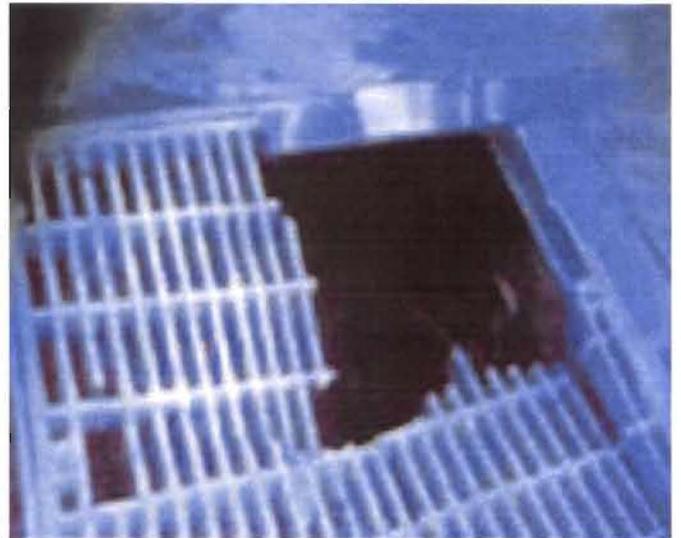


12 inch long tubular channels prevent hair from entangling



We wanted not only to resolve the problem of body entrapment but also looked at all of the other entrapment hazards. We envisioned that a long straw would function to allow the water to flow at the rate necessary, but would not allow hair to entangle. A series of similar straw-like tubes of a length long enough to eliminate the possibility of hair entanglement would resolve this problem. The 2006 guideline suggested that hair lengths of up to 12 inches would be used to test the avoidance of hair entrapment so our goal was to eliminate entanglement of any hair up to 12 inches long. There are very few children even up to early teens that have hair lengths longer than 12 inches. Testing is now done using 18" long hair but only older people have hair long enough to reach beyond the end of the tubes in our system. The BeeSafe System is the best answer to hair entrapment.

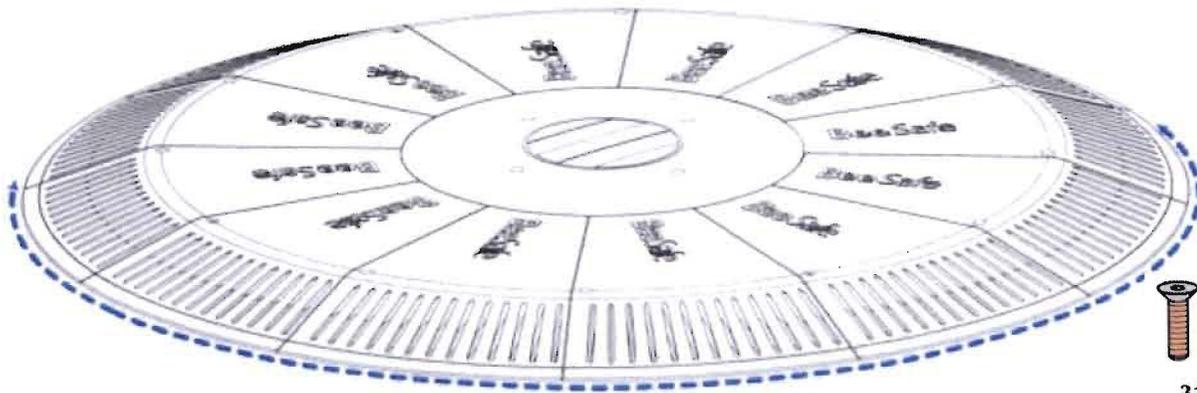
The standard for compliant covers today requires the materials to be much stronger, the attachment hardware to be of higher quality and the products are tested to be sure they will remain intact throughout the lifetime of the product. The educational materials now used to train pool operators all warn that a pool must be closed if a cover is damaged or missing.



Conditions like the one illustrated above are not likely to happen with the stronger materials and design criteria required for compliant products on today's market. We designed the BeeSafe System not to just meet the requirements but to exceed the standard to make this the safest possible solution for all types of pools large enough to accommodate the size of our system. The BeeSafe system is made of Gerogia Gulf 7140 PVC which is one of the strongest materials available that also offers the best chemical resistance to avoid damage from prolonged use in a swimming pool environment (offering great strength as well as durability).



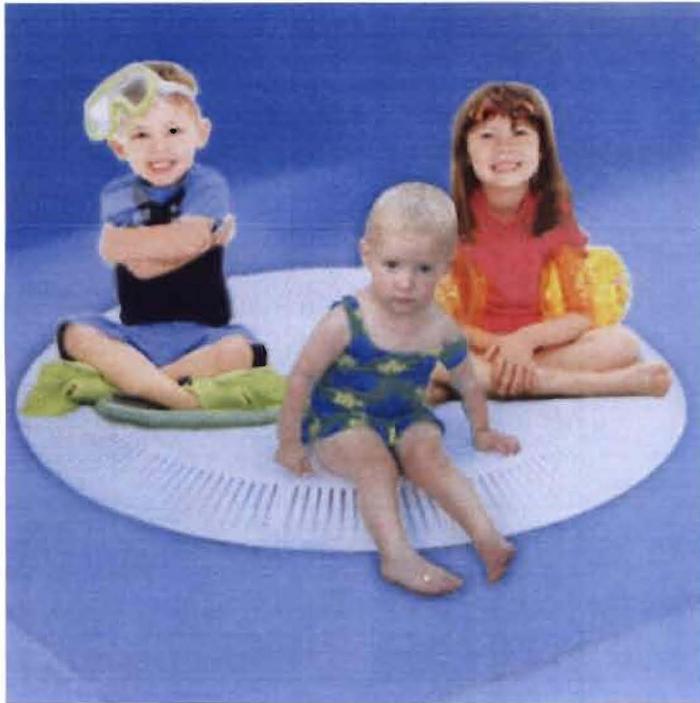
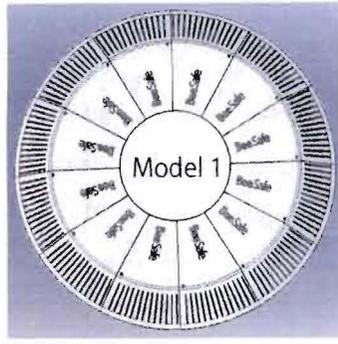
----- **Underwater industrial adhesive applied around the base of the system**



316 stainless steel screws treated with lock tite



Not only is the BeeSafe System attached with the standard #316 Stainless steel hardware, but additionally the use of Mr. Stickys strong industrial adhesive as the final step in installation assures that the edge of the BeeSafe System will be smooth to avoid scratches or the stubbing of toes as well as to make the installation permanent. In order to remove the system a special tool will need to cut the cover from the pool floor. The smaller lid of the BeeSafe System can be removed, so to make this part of our system exceed the standard, we use lock tite treated screws to avoid any vibrations that would cause the lid screws to become loose. The screws require a specialty screw driver and cannot be removed with a straight screwdriver or knife. All of these additional features make the BeeSafe System the best solution for suction entrapment avoidance.

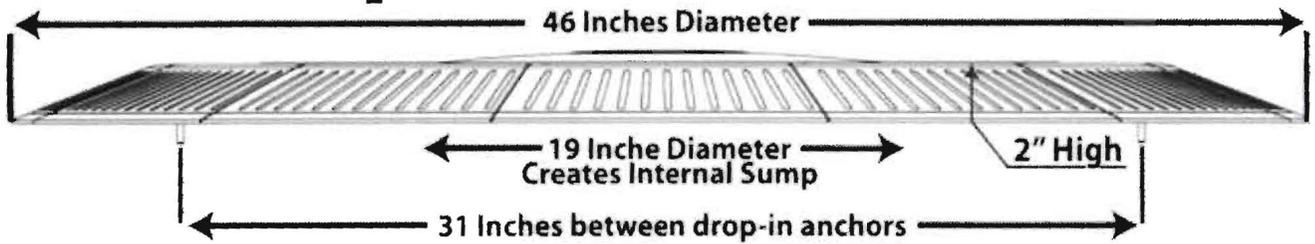


VI. BeeSafe is the safest solution.

A. Tubes Unique Action Releases as Fast or Faster than SVRS

BeeSafe Systems was designed to be the safest alternative. We envisioned that the place it would be best used would be in small kiddie / wading pools that are actually low volume. Even though the sump beneath the cover would be small, the large number of tubes that circulate the pool's water through the drain system would individually have little detectible suction. Even if there were a group of children sitting on the cover there would be more of the openings not covered than there would be openings blocked. The one feature that makes the BeeSafe System equal to or better than a back-up breaker is the emptying of the tubes if they become blocked. Water still will be flowing through all that are not blocked. Any that become blocked will simply empty into the internal sump and any suction at the surface will be released. This action can be compared to a hydraulic switch. The action is as fast as or faster than any of the breaker secondary systems currently on the market. Because of this benefit of the BeeSafe System there would be no advantage gained by the addition of an SVRS device.

B. Internal Sump



Most pools that have installed the BeeSafe System have made this choice based on large volume and high turnover rates. Some have decided on our product because their pool was built without a sump. Our product does not undermine the need for a sump but rather has incorporated an adequate sump internally. The opening at the center of the system was mathematically calculated by an engineer to handle drain systems with up to 4 inch pipe size. But testing was done with 8 inch pipe and found to be adequate to the ASME A112.19.8b-2009 Standard. Other products have chosen to have testing done to see if they pass without a sump, but these products do not incorporate a sump into their product.

The internal sump, the patented tubular system, the large number of tubes that provide an unblockable condition, and the mechanism for emptying the tubes that are blocked, all add up to this being a complete drain system rather than just a drain cover.

The best solution should have always been based on safety, but reality is that price and big company marketing have steered the industry to less adequate solutions. CPSC needs to look at the available products and see that classifying the BeeSafe System as equal to or better than either dual drains or a single drain with a secondary back-up system is a correct decision. This would allow the use of the BeeSafe System with all sizes of drains and with either single or dual drains.

BeeSafe Systems should be the best solution for all sizes and volumes of pools. CPSC can help to make this a better option for all pools by determining that BeeSafe Systems be listed as an Other System that is equally as effective as, or better than, the systems described in subclauses (I) through (V) of the Virginia Graeme Baker Pool and Spa Safety Act.

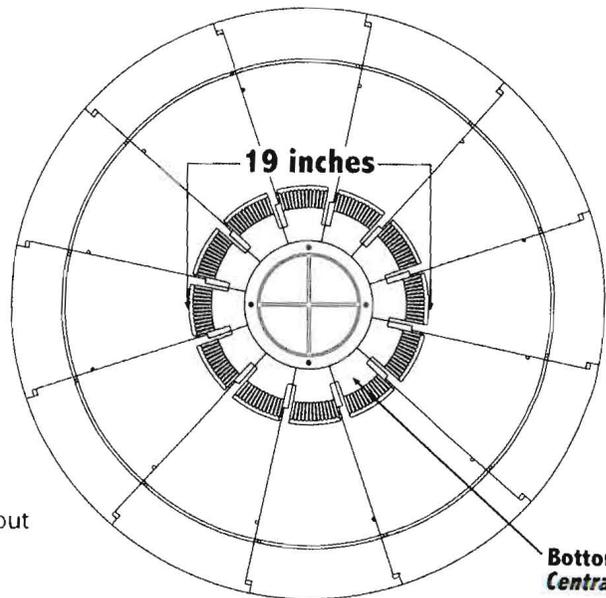
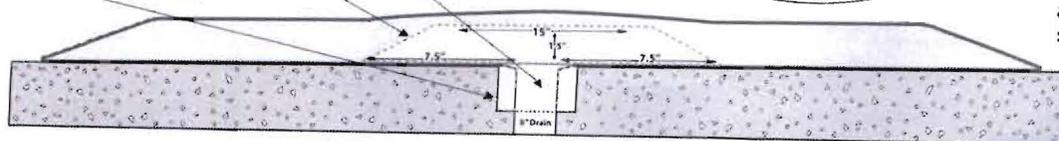
The system doesn't require a sump for outlet piping up to 8 inches in diameter, as the open area of the system becomes a sump.

Space makes a sump and can be used with any size drain line up to 8 inches

System provides sump of 19" x 1 1/2"

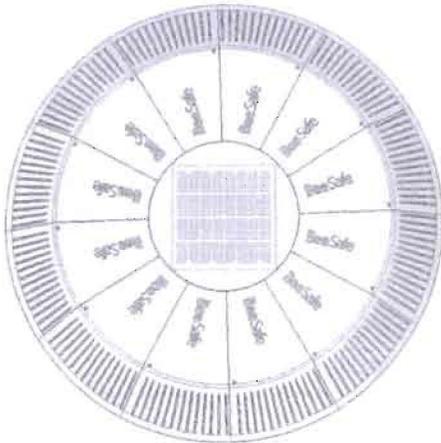
System used with sump

System without sump

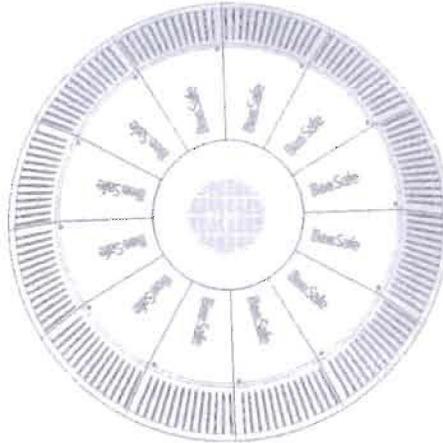


Bottom view. Central open area replaces sump.

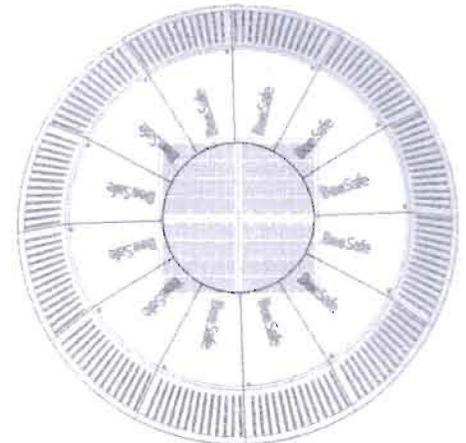
C. The BeeSafe System should be used with any size or shape or existing openings up to 24x36 inches



12 inch square opening



9 inch round opening

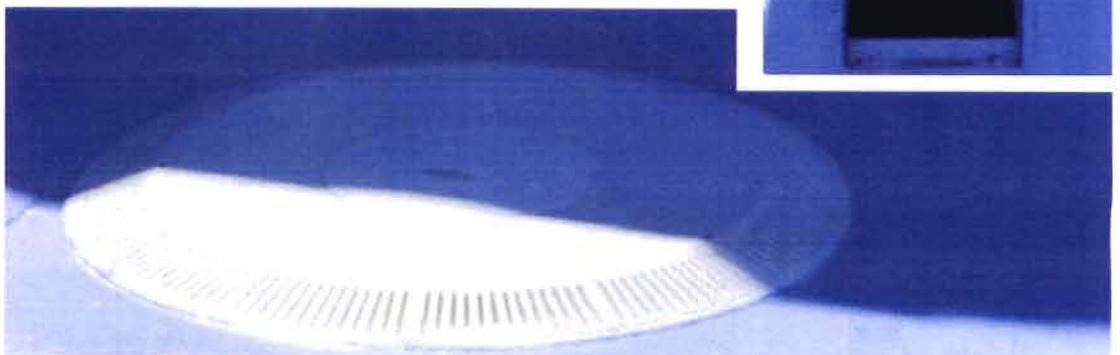
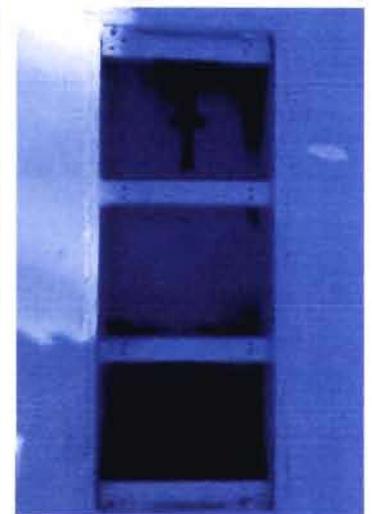


18 inch square opening

The illustrations above show how the BeeSafe System can be used over several sizes of existing drains. The old cover would be removed and BeeSafe installed over the open sump. BeeSafe can be used with larger than 18" drain openings as the existing sump would only add to the BeeSafe internal sump. If the opening can fit under the BeeSafe System and still allow for attachment of at least one of the stainless steel mounting screws, the underwater industrial adhesive will provide a compliant and permanent installation. In some cases BeeSafe is adaptable for many larger sizes of drains, sometimes with modification to the drain opening.

D. Good Answer for Aluminum Pools.

These pictures show the installation into an aluminum pool that could not utilize other options to come into compliance. This pool did not have many options for compliance because of the large volume, oversized sump and drain opening, and material used to construct the pool. BeeSafe





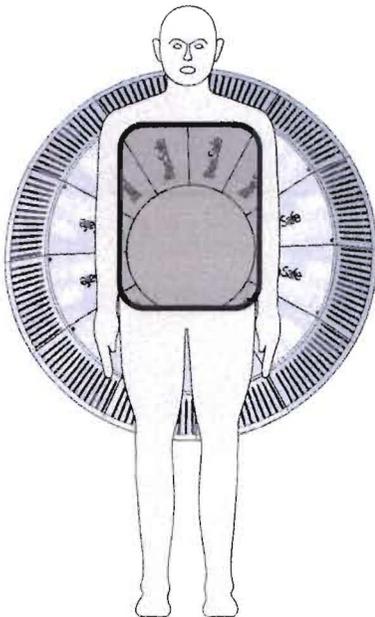
E. So what if a cover goes missing

Previous discussion of the permanent attachment of the BeeSafe System to the pool floor explained how we have eliminated the possibility of the entire cover ever going missing. But what would

happen if the winterizing lid were to go missing? The answer is simple: most likely, nothing. There would be no body entrapment because the tubes would still be functioning and there would be no possibility of blocking them to create a suction entrapment. The lid opening is small enough and the rise of the BeeSafe System off the floor of the pool high enough that even if the cover were gone there would not be a risk of an evisceration. As there is no grate, if the winterizing cover were damaged or missing there would be no risk of a hair or mechanical entrapment with the BeeSafe System. Addition of an SVRS or turn-off switch would not add to the protection that is already built into the BeeSafe System.

This product and all compliant products are required to use stronger materials than were previously used for drain covers. The possibility of a broken cover is much less than with non-compliant products. We use one of the most durable PVC's available to reduce the risk of cover damage. One of the testing agents made the

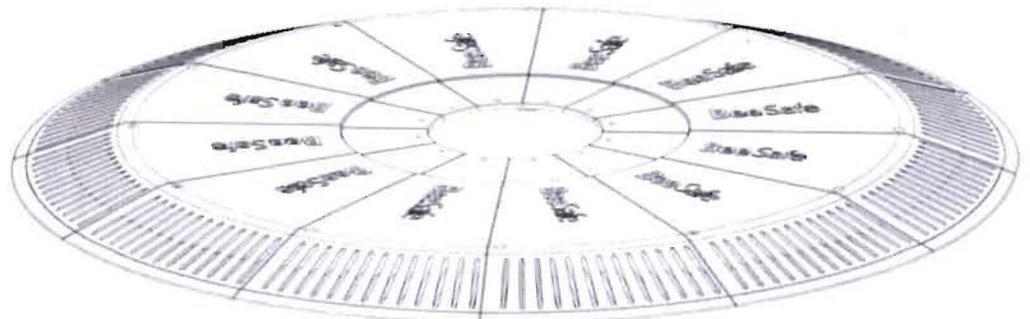
comment that while compliance requires structural tests he could probably drive a tank over the BeeSafe System and not do it any damage. We take pride in knowing that



we have made a structurally sound product.

With any missing drain cover there could be a possibility for an arm or leg to get stuck in the drain line. There is no back-up or layer of protection that could completely eliminate this risk. The best solution of course is to act upon the most emphasized precaution that is stated in the CPSC Pool Safety program, recommended by APSC, given as required in all installation manuals for compliant covers, as well as taught in all pool training courses: There is no back-up for a damaged or missing drain cover. The pool and especially the drain cover should be inspected every day that the pool is open. We state that the cover must be inspected on this daily basis and that if the cover is damaged or not intact (including any screws missing) then the pool must be closed. To avoid any possibility of entrapment while the cover is being replaced, it should be recommended that the pump be turned off. While this would allow for bacterial growth and could endanger the health of a trespasser into the pool, this would be less of a risk than the possibility of entrapment.

BeeSafe Systems offers the best available option to avoid suction entrapment at the pool outlet even if the winterizing cover were to go missing.



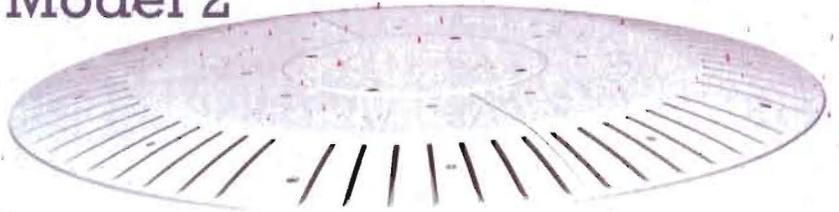
VII. BeeSafe Systems Model 2

Right at the time that CPSC announced that they were reversing the decision on Unblockable Drains, we had a second product at IAPMO for testing. We invested all that was available to our company in development of this smaller model of the BeeSafe System but it has not yet been produced. Because we could not see any market for a product that would cost much more than the smaller products that gain some advantage when coupled with an SVRS device, we decided to not go ahead with production of this product at the time.

Basically Model 2 is a smaller version of the original BeeSafe System. Because it is smaller (the diameter is reduced by 12 inches) the tubes are shorter and the sump size is slightly reduced. These differences make the application be for use only in smaller pools with less volume and lower flow rates. It does not provide as complete of protection from hair entrapment, so we designed it with an additional benefit. If a swimmer goes near the drain cover their hair will most likely only mat at the surface because there is a much wider space of solid PVC material between the openings of the long tubes. Use of this model on a small pool will be safer than use of any other cover rated for a low volume pool.

Independent testing has shown that even if the cover were missing, BeeSafe Model 2 would not subject a body to entrapment. As with the original BeeSafe System, the tubes would continue to function and the suction would not be blocked. As the installation also would be the same as with the original BeeSafe System, the risk of the entire cover being damaged or missing is not a concern.

We emphasize that the original BeeSafe System is the only product that we currently have in production. We currently are unable to cover the cost of first production of Model 2 as the reversal of decision on unblockable drains has had a drastic impact on our sales. Our current prospects include sale of either or both products to another company and even the possibility of sale of our patent to cover our investment liabilities. We have not paid for the compliance certificate for Model 2 but have completed and passed all of the required testing on this product. Model 2 could be a



valuable addition to the drain covers in the world-wide pool market if we are ever able to produce it.

We developed Model 2 during 2010 and 2011 to be more competitive with the other unblockable covers that were then on the market. There has been some interest in the prototype from manufacturers of some SVRS devices to endorse this product as a companion to their products. While either of our products with or without a backup system would be great for the making a pool safer, neither would be enhanced with an SVRS or breaker. The SVRS or breaker would have fewer false triggers and probable only activate if there were problems with the flow dropping on the pump side of the system.

Entrapment hazards are greatly reduced with either model of the BeeSafe System. Water would continue to flow through the tubes even if some of them were blocked. We have included pictures of model 2 in this presentation, but emphasize that it has not been produced. We will only go ahead with making this product with the determination of CPSC that it is equal to or better than the other options and that it is considered as the "Other Option" under the VGB Act.

While this paper has been written for consideration of the original BeeSafe System, we would like to also have a decision on model 2 as meeting the classification of "Other Options" covered in the VGB Act before we decide to manufacture or sell it. We prefer not to be forced to sell this product to some other company. We have included Model 1 and a Model 2 prototype with this petition so CPSC can view and verify all of our claims. We are confident you will see that we have developed two products that should be considered as equally effective or better than the other options described in the VGB Act at eliminating the risk of suction entrapment.

Introducing BeeSafe Model 2

1-888-306-0121 www.beesafesystems.com



Designed to Address All 5 Forms of Entrapment!

The smaller lighter weight BeeSafe Systems Model 2 is a Safety Drain System designed to retrofit over existing pool drains.

-Hair, Body & Evisceration Entrapment-

56 Individual 5 inch Tubular Channels make up the System. They Function like Self Regulating Hydraulic Switches. Hair will follow a pattern of laminar flow and not tangle.

-Finger, Mechanical & Evisceration Entrapment-

Outside Opening of the Tubes have a small 1/4 inch diameter preventing fingers or Jewelry (dog tags) from becoming entrapped.

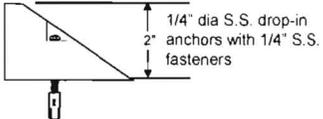
-Limb Entrapment & Evisceration-

Proper fasteners assure the system will remain attached to prevent limb entrapment or evisceration.

-Body Entrapment-

-18 x 23 Body Blocking Element-

Used in ASME Testing. Only 20% of the BeeSafe System is Blocked.



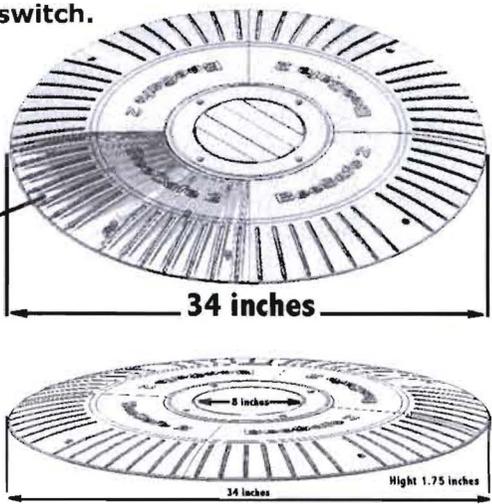
The body of the BeeSafe System is permanently installed, so that a body or limbs cannot reach the suction piping. This also prevents missing or broken drain covers. (Only the lid & its fasteners need to be replaced every 7 years)



The unique feature of the BeeSafe System is the patented tubular design. The channels/tubes run a full 6 inches into the system, resolving entrapment. The action of each tube is similar to a self-regulating hydraulic switch. This virtually eliminates body entrapment.

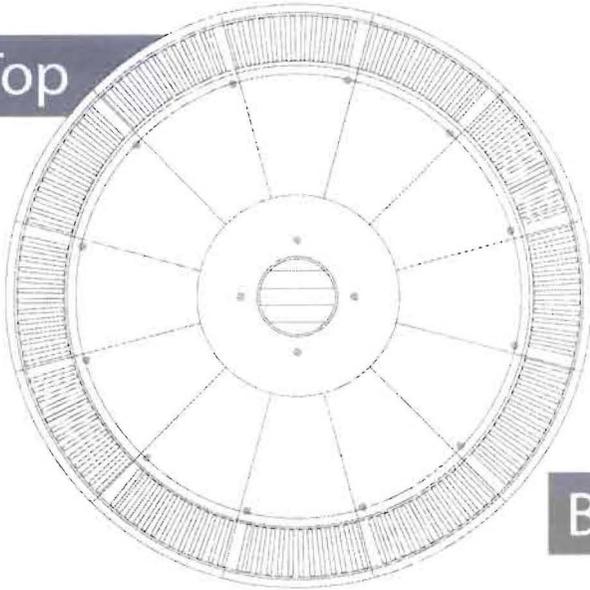
- Prevents bather entrapment
- ASME A112.19.8-2007 b-2009
- VGB compliant
- IAPMO Certified
- Easily installed over Main Drains
- Includes stainless steel hardware
- Covers up to 24" x 24" main drain
- Life: 7 years – submerged outlet
- Certified to cover up to 12" drain pipe
- Easily installed over existing main drains
- Georgia Gulf Plastic with slip resistant surface

Cutout Showing Individual Tubular Channels

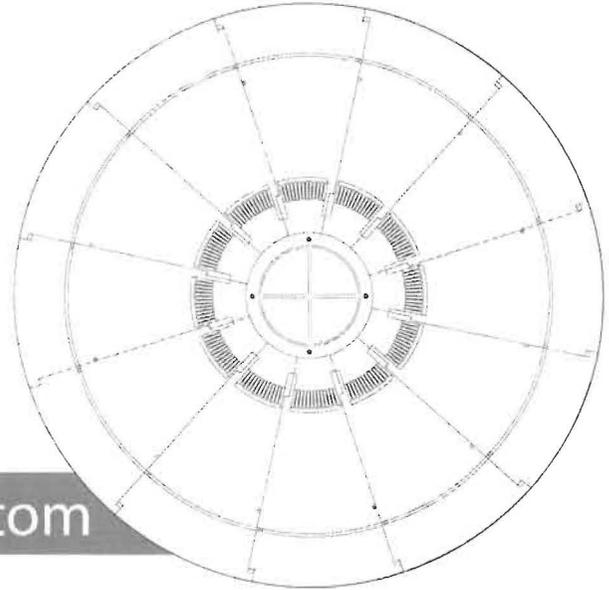


Simply a Better Answer to Suction Entrapment!!

Top



Bottom



VIII. Some of the reasons why BeeSafe is a better choice for all sizes of pools.



1. Isolation of the actual drain line reduces the hazard.
2. Without major modifications older pools can become compliant.
3. Large Drains require high volume outlet covers – BeeSafe is a good solution for large pools. Body entrapment testing at 6,000+ GPM. Certified at 1,220 GMP flow rating.
4. Small low volume pools will have such low flow through the BeeSafe System that hair will not flow into the drain and body entrapment will be eliminated.
5. Problems associated with Secondary Back-up systems are resolved by using the BeeSafe System.
6. Even if the cover goes missing, the BeeSafe Cover will still protect from entrapment.

IX. Summary & Conclusion

A. VGB Product Comparisons



Dual Drains

BeeSafe Systems vs Dual Main Drains

BODY	Avoids Body Entrapment	Best	Some*
	Avoids a single body entrapment	YES	Yes*
	Avoids potential for 2 simultaneous drowning	YES	NO
	System remains in balance	YES	NO
	Avoids potential fill with wind blown sand/debris	YES	NO
HAIR	Avoids Hair Entrapment	Best	Some*
	Provides tubes - swimmers are aware of hair entry before entrapment can happen	YES	NO
	Hair more likely to mat at surface than enter the drain	YES	NO*
FINGER & LIMB	Avoids Finger & Limb Entrapment	Best	Some*
	Least likely to be damaged or missing	YES	NO
MECHANICAL & EVISCERATION	Avoids Mechanical Entrapment	Best	Some*
	Avoids dog tags or jewelry entrapment	YES	NO
	Avoids necklace, chain entrapment	YES	NO
	Avoids Evisceration Entrapment	Best	Some*
	Permanent Install	YES	NO
	Material Strength - Not likely to be damaged	YES	NO
	Provides thread lock coated screws	YES	NO
OTHER	Easy Install	Best	NO
	Underwater Install	YES	NO
	Doesn't require additional sump	YES	NO
	Can be installed where there is no sump	YES	NO*
	Provides an internal sump	YES	NO
	Avoids damage to pool floor integrity & future crack lines	YES	NO

* Dependant on choice of compliant cover. Some are good to avoid 1 or 2 but not all 5 types of entrapment



Compliant Cover & Secondary Device

BeeSafe Systems vs Compliant Cover & Secondary Device

BODY	Avoids Body Entrapment	Best	Some*
	Quick response to body entrapment	YES	NO
	Avoids false trigger activation	YES	NO
HAIR	Avoids Hair Entrapment	Best	Some*
	Provides tubes - swimmers are aware of hair entry before entrapment can happen	YES	NO
	Hair more likely to mat at surface than enter the drain	YES	NO*
FINGER & LIMB	Avoids Finger & Limb Entrapment	Best	NO
	Least likely to be damaged or missing	YES	NO
MECHANICAL & EVISCERATION	Avoids Mechanical Entrapment	Best	Some*
	Avoids dog tags or jewelry entrapment	YES	NO
	Avoids necklace, chain entrapment	YES	NO
	Avoids EVISCERATION Entrapment	Best	Some*
	Permanently installed	YES	NO
	Provides thread lock coated screws	YES	NO
	Easy to maintain - avoids need to be reset	YES	NO
	Always Functioning	YES	NO
OTHER	Avoids chemical unbalance from being turned off	YES	NO
	Does not require daily function disablement	YES	NO
	Does not require any piping changes	YES	NO
	Easy Install & Underwater Install	Best	NO*
	Doesn't require additional sump - Provides an internal sump	YES	NO
	Can be installed where there is no sump	YES	NO*
	Lifetime of product	15 years Lid Only	3-5 Years Whole Product

* Dependant on choice of compliant cover. Some are good to avoid 1 or 2 but not all 5 types of entrapment

BeeSafe Systems vs other so called Unblockables



Other Unblockable

BODY	Avoids Body Entrapment	Best	Some*
	Avoids potential for 2 or more simultaneous drownings	YES	NO*
	Provides tubes with action to quickly release blockage	YES	NO
	Avoids potential fill with wind blown sand/debris	YES	NO
HAIR	Avoids Hair Entrapment	Best	Some*
	Provides tubes - swimmers are aware of hair entry before entrapment can happen	YES	NO
	Hair more likely to mat at surface than enter the drain	YES	NO
FINGER & LIMB	Avoids Finger & Limb Entrapment	Best	Some*
	Least likely to be damaged or missing	YES	NO*
MECHANICAL & EVISCERATION	Avoids Mechanical Entrapment	Best	Some*
	Avoids dog tags or jewelry entrapment	YES	NO
	Avoids necklace, chain entrapment	YES	NO
	Avoids EVISCERATION Entrapment	Best	Some*
	Permanently installed	YES	NO
OTHER	Provides thread lock coated screws	YES	NO
	Lifetime of whole product or lid only	Lid Only	Whole Product
	Product Shown at Consumer Product Safety Commission	YES	NO
	Hearing on Unblockable Drains		
	Considered by CPSC for permanent installation of body of product	YES	NO
	Considered as the safest solution for all types of entrapment by CPSC in unblockable hearing decision webcast 3-2010	YES	NO
	Easy Install & Underwater Install	YES	NO*
	Doesn't require additional sump - Provides an internal sump	YES	NO*
Can be installed where there is no sump	YES	NO*	

* Dependant on choice of compliant cover. Some are good to avoid 1 or 2 but not all 5 types of entrapment

B. Information Ads



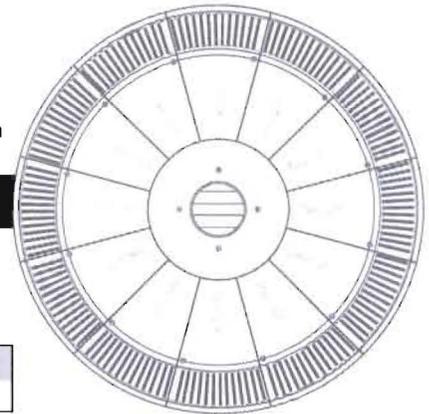
BeeSafe
SYSTEMS, LLP

1-888-306-0121
www.beesafesystems.com

Unique Safety features of the BeeSafe System.

The BeeSafe Systems Model 1 is a Large Unblockable High Flow Safety Drain System to retrofit over existing pool drains.

Overall Size	Weight	Flow Rate	Sump	VGB	ASME
46 inch diameter	90 pounds	792 GPM	Internal Sump	Approved	Certified



BeeSafe is a large unblockable system, not just a little drain cover!

Its BIG. Its heavy. It does it all as a stand alone product to solve all problems of entrapment.

Makes your single or multiple main drains unblockable! No need for a second level of protection! Can be used with or without a sump.

-Hair, Body & Evisceration Entrapment-

156 Individual 12 inch Tubular Channels make up the System. They Function like Self Regulating Hydraulic Switches. Hair will follow a pattern of laminar flow and not tangle.

-Finger, Mechanical & Evisceration Entrapment-

Outside Opening of the Tubes have a small 1/4 inch diameter preventing fingers or Jewelry from becoming entrapped.

-Limb Entrapment & Evisceration-

Proper fasteners assure the system will remain attached to prevent limb entrapment or evisceration.

-Body Entrapment-

-18 x 23 Body Blocking Element-

Used in ASME Testing. Only 20% of the BeeSafe System is Blocked.

The body of the BeeSafe System is permanently installed, so that a body or limbs can not reach the suction piping. Also prevents missing or broken drain covers. (Only the lid & its fasteners need to be replaced every 7 years)

Designed to Address All 5 Forms of Entrapment!

- **Body Entrapment** - The size of the system, and the self regulating hydraulic switch mechanism of the tubes makes body entrapment nearly impossible. Flow Testing for body entrapment exceeded 6,000 gallons per minute, so even several bodies on the surface at the same time would not likely become entrapped. The outer 6 inches that encompasses the openings is sloped so bodies will likely slide off.
- **Hair Entrapment** - Flow Testing found that hair will most likely mat at the surface. If hair does enter the tubes it will follow a pattern of laminar flow until exiting into the sump or drain line. The tubes are a full 12 inches long to prevent hair entanglement. Even hair longer than the tubes will not likely entangle because of the laminar flow.
- **Finger & Limb Entrapment** - The tubes are small in diameter to prevent fingers and toes from entering. The lid of the System is securely fastened with 316 stainless steel screws and inserts preventing limbs from reaching the suction piping.
- **Mechanical Entrapment** - The small size diameter and long length of the tubes combine to avoid mechanical entrapment, such as clothing a chain or other jewelry items.
- **Evisceration** - Securely fastened 316 stainless steel anchors & screws in the bottom of the pool prevents damage or missing covers. The unique design acts to prevent suction when a body sits on the surface.

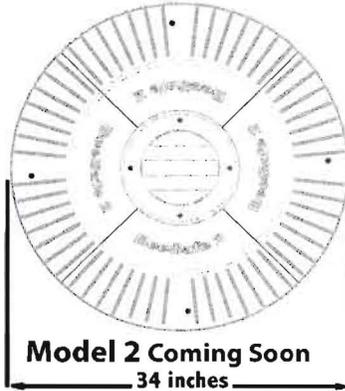
Simply a Better Answer to Suction Entrapment!!



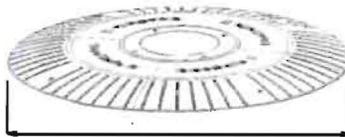
BeeSafe Systems.

Unblockable protection now with 2 models to choose from.

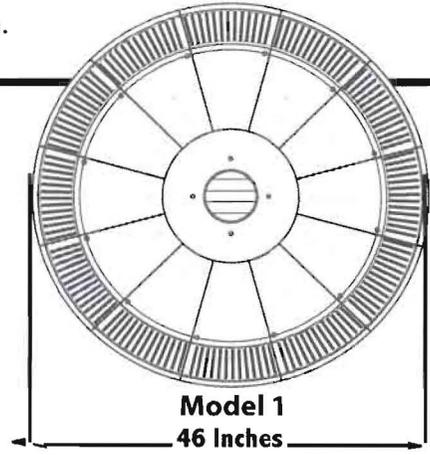
www.beesafesystems.com



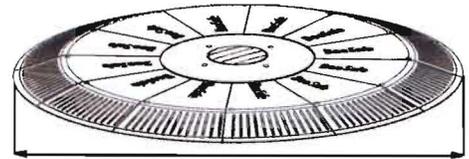
Model 2 Coming Soon
34 inches



34" diameter x 1.75" high
GPM 224



Model 1
46 Inches



46" diameter x 2" high
GPM 1100

VGB Approved Main Drains

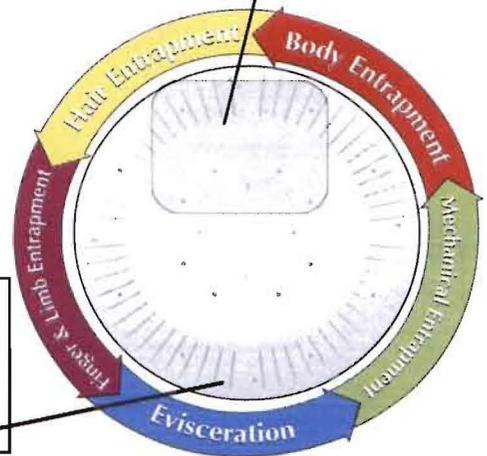
ASME/ANSI APPROVED & IAPMO CERTIFIED

The unique patented tubular system design protects pools & Swimmers from all entrapment hazards associated with the main drain in swimming pools & spas.

- Prevents bather entrapment
- VGB Certified - IAPMO Certified
- Easily installed over Main Drains
- Strong chemically resistant PVC
- Slip resistant surface - No trip hazard
- Easily installed over existing main drains
- Includes stainless steel hardware
- For use with up to 12" drain pipe
- Can be used with or without a sump.

-Body Entrapment-
-18 x 23
Body Blocking
Element-
Used in ASME Testing.

Numerous tubular channels make up the system. If hair enters the system it will follow a laminar flow pattern & cannot tangle. The outside opening of the tubes/channels have a small openings preventing fingers or Jewelry (dog tags) from becoming entrapped.



1-888-306-0121
www.beesafesystems@gmail.com

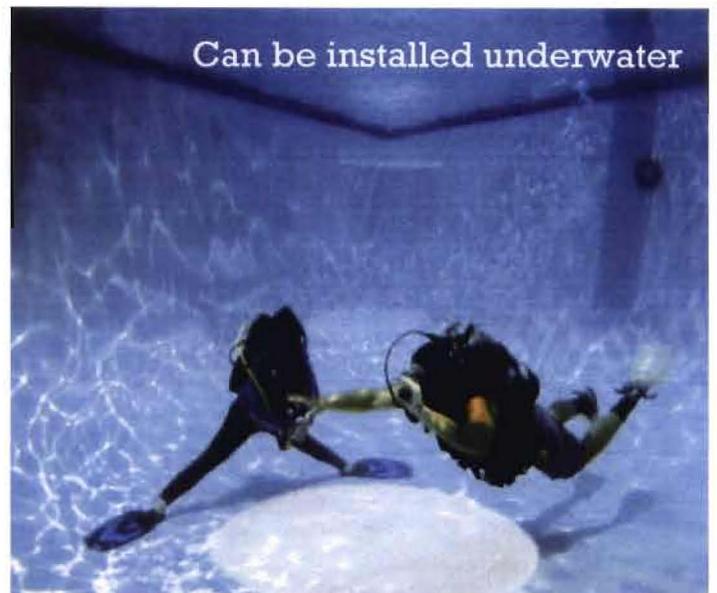
**Layers of protection built into the system
Designed to Address All 5 Forms of Entrapment!**

Simply a Better Answer to Suction Entrapment!!



C. Conclusion

BeeSafe Systems is the best solution for all sizes and volumes of pools. CPSC can help to make this a possible better option for all pools. Do this by determining that BeeSafe Systems original Model One, and in the future when actually produced that BeeSafe Systems Model Two, be listed as an "Other System" that is equally as effective as, or better than, the systems described in subclauses (I) through (V) of the Virginia Graeme Baker Pool and Spa Safety Act



BeeSafe Systems

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