

Typical Chemical Additions to the Main Pool:

Add **50 lbs. of Cyanuric Acid** to the main pool before the start of the season. This acts as a stabilizer for chlorine, protecting it from destruction by the summer sun. Cyanuric Acid affects the ORP calibration of the Aquasol controller, so add this soon after the pool is filled with water so you can proceed with calibrating the controller. As the summer progresses, monitor the cyanuric level and add enough to always keep it above 50 ppm. Doing this normally consumes another **50 lbs.**

 **(1 lb. of Cyanuric Acid seems to raise the main pool 1 ppm.)**

The Cyanuric Acid doesn't dissolve easily, it takes some effort. If you add it directly to a skimmer, go slowly so it has the best chance to dissolve before reaching the filter. Take your time; don't get impatient. Alternatively, you can try dissolving it in a bucket of hot water before putting it into the skimmer. Also, don't change or clean the filter cartridges for a few days afterward so that any Cyanuric caught by the filters will have dissolved completely.

Add **100 lbs. of Calcium Chloride** at the start of the season to raise the calcium hardness. This should get it above the minimum of 150 ppm. Have another 50 lb. bag or two ready for the rest of the summer. Add more as required and as you see fit to balance the pool as per the Taylor Watergram. Before adding this to a skimmer, remove any basket or flow-balancing valve because they might be melted during the exothermic reaction of calcium chloride and water. Add it slowly to avoid excessive heat within the skimmer, and don't put your hands in there either or you might be burned.

Total Alkalinity (T.A.) plays a role in buffering against sudden swings in pH. When the pool is first filled, this is often at 40 ppm. This is below the normally recommended value.

The Main Pool's pH stays reasonably steady as it is; additional buffering doesn't seem to be required. So, for the Main Pool, just keep the T.A. on the low end; don't add other chemicals to raise it.

(In contrast, the Wading Pool, being a small body of water, experiences large swings in pH as sodium hypochlorite is added. It requires active & accurate pH control. It works better with a higher T.A. and higher pH setpoint. But you do have to monitor the Wading Pool's T.A. and keep it below 150 ppm so that the Aquasol's pH controller works accurately, as per the Aquasol instruction manual.)

Superchlorinate with **15 gallons of Sodium Hypochlorite** as required, but probably at least once a week during July when the temperature & bather load rise. A Friday night is good if there is no swim meet on Saturday morning; a Saturday night is good since the pool isn't used on Sunday morning; even Sunday night would do if the Monday swim team practice is a play-day.

 **(1 gallon of Sodium Hypochlorite seems to raise the main pool 1 ppm.)**

You could likely get by with less than 15 gallons, but our schedule is so tight that you should be sure the job is successful whenever you do get a chance for superchlorination. The pH will shoot up when the chlorine is added but will likely settle back down by itself overnight. Utilize the markings on the side of the chlorine tank to measure the 15 gallons; use a piece of tape to mark the level before you begin so you don't lose track of where you started.

Add **64 ounces (2 qt.) of Pool Perfect** as needed to combat oils & sunscreen. Do this once a week, especially during the peaks of bather load, water temperature & sunscreen usage. The benefit is cleaner waterline tile and reduced cartridge filter gumup. Don't do this during a superchlorination session, as per the instructions on the bottle. (I buy this Pool Perfect at Leslie's Pool Supply on Ritchie Hwy. near Jumper's Hole Road.)

Other operational notes:

Make the daily cleaning of the skimmer baskets the first thing you do each morning; if there is a dead animal in a skimmer, you'll want to know about it as soon as possible. Then move on to other cleaning tasks.

Restrooms are to be **sanitized** each day and then thoroughly checked & maintained **each hour**. *Recognize this is an important health issue! Protecting against disease is a significant part of your job.* **DON'T NEGLECT THIS; MAKE IT PART OF THE ROTATION SCHEDULE.**

Loungers that do not have plastic feet or knobs on the bottom are to be kept in the grass and off of the concrete. Otherwise, the concrete wears out the bottom runners.

Loungers are not allowed in the baby pool, as per our rules. *(Parents are to be sitting upright, observing their children, not sunbathing.)* To help in this matter, ensure that the baby pool area has an over-abundance of Adirondack chairs. Remove any loungers as part of your morning & nightly cleanup of the area. Also, keep two of our fiberglass picnic tables in the area.

WADING POOL TARGET VALUES

pH	7.6 - 7.8	7.0 7.2 ----- 7.4 ----- 7.6 --▼-- 7.8 8.0
Free Chlorine	3 - 5 ppm	
Total Alkalinity	80 - 120 ppm	40 . 50 . 60 . 70 . 80 - 90 - 100▼- 110 - 120 . 130 . 140 . 150 = 160
Calcium Hardness	150 - 400 ppm	50 . 100 . 150 - 200 - 250 - 300 - 350 - 400 . 450 . 500
ORP	in the 700 hundreds	▲

The pH should run on the high side (7.6 - 7.8) so that an ORP value below 800 will provide the target Free Chlorine level of 3-5 ppm. A lower pH would indeed make the chlorine more active, but for this body of water the resulting ORP value would be above 800, in which range its correlation with Free Chlorine is ill-conditioned. So use a pH of 7.6 to 7.8.

The Free Chlorine in the wading pool is subject to destruction by the sun. If this occurs while the wading pool sits unused for an extended period, the water can still retain a remnant of its oxidation reduction potential that keeps the ORP measurement from dropping. Without a drop in the ORP, the controller won't add the required additional chlorine.

This is sometimes the situation at noon, before the pool gets any use. Once children do enter, the ORP will plummet and the controller will respond by energizing the metering pump.

During such periods of reduced Free Chlorine, the water is still sanitary since the ORP remains high. And, swimmers aren't really being affected since no one is in the wading pool. The problem lies in the fact that our manual measurements will register the zero Free Chlorine level, so we're not satisfying health department guidelines.

Therefore, if this situation arises, manually add chlorine to satisfy the expected Free Chlorine minimum of 3 ppm.

Total Alkalinity (TA) must always be less than 150 ppm for the Aquasol controller to give accurate pH readings. To be safe, use a target maximum of 120 ppm; if the TA hits 120, lower it with muriatic acid at closing time. Conversely, baking soda should be used to increase the TA to at least a minimum of 80 ppm, but preferably to 100 ppm. Measure, record and adjust the Total Alkalinity at least once each week.

Calcium Hardness should be at least up to the minimum of 150 ppm.

pH			
To Raise	pH	0.1	add <u>0.6 oz</u> Soda Ash
To Lower	pH	0.1	add <u>1.5 oz</u> Muriatic Acid (Push and hold the ON button of the metering pump for 2 minutes) ¹

Free Chlorine

To Raise	Free Chlorine	1 ppm	add <u>2.6 oz</u> Sodium Hypochlorite (12%) (1.07 oz /1000 gal) * 2,400 gal (Push and hold the ON button of the metering pump for 73 seconds) ²
To Raise	Free Chlorine	1 ppm	add _____ oz Dry Chlorine
To Lower	Free Chlorine	10 ppm	add <u>6 oz</u> Leslie's Chlor Neutralizer (this also lowers pH; read the label)

Total Alkalinity

To Raise	TA	10 ppm	add <u>5.4 oz</u> Baking Soda (2.24 oz /1000 gal) * 2,400 gal
To Lower	TA	10 ppm	add <u>6.1 oz</u> Muriatic Acid (2.56 oz /1000 gal) * 2,400 gal

Calcium Hardness

To Raise	Hardness	10 ppm	add <u>4.6 oz</u> Calcium Chloride (77%) (1.92 oz /1000 gal) * 2,400 gal
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Note: Fresh water that is added to the wading pool typically has a initial TA of **40** ppm and a Calcium Hardness of about **50** ppm.

¹Assumes a 1/4" O.D. Pump Tube, giving 0.071 oz/min at 10% duty cycle, but 0.71 oz/min while holding in the ON button.

²Assumes a 3/8" O.D. Pump Tube, giving 0.213 oz/min at 10% duty cycle, but 2.13 oz/min while holding in the ON button.

FLEXFLO Peristaltic Metering Pumps on the Wading Pool

Model “A1N20S-4T” is a configuration of a Blue-White A100N pump that provides a very low rate of flow (0.8 GPD or 0.07 oz/min). This is pumping muriatic acid into the wading pool for pH control.

Model “A1N20S-6T” is a configuration of a Blue-White A100N pump that provides a low rate of flow (2.4 GPD or 0.21 oz/min). This is pumping sodium hypochlorite.

The “A1N” is shorthand for A100N.

The “2” is a code for the gearbox’s 45 RPM speed.

The “0” is a code for 115V/60Hz electricity.

The “S” is for “Spa”, meaning “low volume” due to the timer’s setting that results in a range of 0.3 - 6 second injection time for every 60 seconds.

The “4T” is a code for the 1/4” O.D. Norprene pump-tube with compression tube nuts (*Blue-White part number A-002N-4T, Norprene*).

The “6T” is a code for the 3/8” O.D. Norprene pump-tube with compression tube nuts (*Blue-White part number A-002N-6T, Norprene*).

Our two A1N20S pumps are themselves identical, the only difference being the size of the pump-tubes that were originally shipped with them.

These low flow-rate configurations were chosen to match the size of the wading pool and are largely a result of the pump’s timer that limits the maximum duty-cycle to 10%, i.e. 6 seconds for every minute. So even with the dial on high (*Percentage of Output = 100%*), the timer inside the pump will only run it for 6 seconds.

The On/Off Button doesn’t actually power off the pump. Instead, if you push it, the pump runs until you release it. Therefore, if the Aquasol controller is passing electricity to the pump and the 10% duty-cycle isn’t providing enough chlorine or acid to the wading pool, just stand there and hold the button for a minute.

The low flow-rates should prevent huge volumes of chlorine from unintentionally overwhelming the wading pool. If these low flow volumes prove inadequate on a hot busy day, then you’ll have to hold the button or otherwise manually add chemicals.