



Facilities, Maintenance and Grounds:

Equestrian Estates

- Set up 1 events at the EQ during this past month.
- Repaired irrigation main break at Longacres park
- Weed abated 5 v-ditches
- Repaired slide bolt at Stall 21
- Weed abated EQ trails and parks, we are at 90% complete
- Conducted weekly stall safety inspection at the stalls
- All arenas have daily dragging as scheduled.
- Performed all scheduled daily duties
- Regular and emergency work orders performed through-out EQ

Buildings

- Regular and emergency work orders performed though-out the SVLA buildings.
- Set up for 10 events lake side.
- Repaired dispatch split AC system
- Repair broken kitchen drawers
- Safety inspections have been completed weekly.
- Fire extinguisher inspections are completed which is done monthly.

Meadowlark Park project phase 2

- Phase 2 is complete except for the following items.
- Backstop has been on order for over 3 months and some items are back ordered and delaying final delivery.
- Red DG has been ordered over 2 months ago and we are waiting for the quarry to have the same red DG available, no matching DG is available from other quarries.

Marina Picnic area project

- Installation of paving stones is complete.
- We were planning on removing only 12" of soil but were required to remove over 18". All pads and walkways have been poured. We will be working on completing the landscaping and artificial grass in house over the next 30 days as well as starting the railing.
- Renderings of final designs will be submitted

Grounds

- Regular work order performed at grounds, restrooms, etc., as required.
- Irrigation repairs at all grass areas as needed.
- Repaired and replaced 37 led light bulbs on the parkway.
- Mounted and repaired wind damaged banner holders on 3 camera poles, holding the thank you banners.
- Repaired pumps at the AO pond
- Changed out the intercom at the Boat launch gate
- Completed weed abatement at all lake side properties including center median all included (29 acres and 1.5 mile median)



Lake and Fishing Areas:

Marina/ Lake

- Installed the replacement 40hp pump at our swim beach, with this replacement it included a more efficient pump and we are now pumping approx. 998 gallons per minute up from the 690 gallons per minute from the old well pump. Our splash zone is capability of handling approx. 1400 gallons per minute, we are within this max.
- Buoy replacement is at 50% complete, we will be continuing this until complete at 4 buoys per day.
- Replaced breaker for our lake siren.
- Daily dragging and inspections of the beach have started and will continue through the summer.
- Added new dedicated outlets for the concert series at the beach.
- Getting an additional consultant to provide a quotation and plan of action to handle the required NPDES permit filling.

Lake Liner repairs

- Complete, lake is back to normal levels.

Lake Filter test

- Report attached



Background

Our lake historically has been working against water issues from upstream flows that bring in high nutrient loads into our lake. We receive water high in Phosphorous and Nitrates as well as discharge from 9 square miles from street and storm drain run-off that flows directly into our lake from County of San Bernardino, City of Victorville and City of Hesperia which has been documented and noted by the original developers; lake experts, Orville P Ball & Associates, Marine Biochemists, Aquatechnex and a study a consultant did for SVLA after the 2004 flooding. These high nutrients create a continues opportunity for algae blooms, high turbidity which directly affects our use of the lake for our Spring Valley Lake residents that use the lake for fishing, boating, recreation as well as affecting aesthetic value of the lake.

In years past the Association by direction of the lake consultants have been addressing the nutrient and turbidity issues chemically, the chemical of choice is Alum or Aluminum sulfate treatments, which is an EPA approved method of treating water and is used in many water treatment facilities. These treatments are now required to be done under a NPDES permit which the Association is currently working on obtaining through the Lahontan regional waterboard. This permit started the SVLA Lake committee to start looking for alternative methods of addressing the issues. The thought was to address the issue using some type of filter system that not only could address the issue but sustain the issues. The lake committee did some testing directly attacking our algae issue since most of the transparency issues of the water is cause from Diatom algae (Eunotia sp. which is classified as Bacillariophyta-Diatoms and is a single-celled, planktonic) their test consisted of testing the water in a centrifuge machine which when the sample achieved approx. 1000g force the diatom broke down and sank to the bottom leaving the top portion clear as drinking water.

This test lead the committee to research centrifuge machines which lead them to filter systems and Rain for Rent which is a worldwide company that a division cleans water after a disaster happens. They made contact and told them about our situation, which lead to an onsite meeting and sampling. This lead to a testing proposal and board approval for the testing to the test today. The testing equipment consisted of 2 sand and gravel filtration canisters to a bag filter and then finally to a polish cartridge filter. Each would be tested in sequence since the as listed the cost of grows in price in that sequence.

We started the test by putting 150 gallons of lake water into a containment, this 150 gallons was filtered at a rate of 20 to 70 gpm (gallons per minute). The first test lasted for about 30 minutes filtering using only the sand/gravel filtration and the 150 gallons was filtered about 6 times before it was concluded unsuccessful. This test did remove any other sediment in the water but not the diatom. The second test added a 5 micron bag and was concluded unsuccessful after 10 minutes and filtering the 150 gallons about 2 times. The third test added a ½ micron cartridge filter and was concluded unsuccessful after 10 minutes and filtering the 150 gallons about 2 times.

This test was not as successful as we needed it to be so we are back onto centrifuge filtration and looking for other filter testing unit. This is an alternative to chemical treatment and still in the exploration and testing phases.





Purpose

To find a sustainable way to maintain a healthy eco system that will benefit our lakes uses without hindering these uses. Chemical treatments are more of a band-aid to the issues at hand and finding a solution that will address more than just one issue would be ideal to the ongoing issues we have with a 200 acre lake and possible addressing issues before they can get out of control. Help water movement within our lake and try to keep the solutions financially within reason.

UV Filter test

The first test which was started on April 19, 2019, consisted of a 5 gallon coarse filter pack bio pressure filter with a 13watt UV light and a 1/3hp pump. The test conduct with pumping 150 gallons of lake water into a container. We then circulated the 150 gallons through the filter at 10gpm and until clarity of over 8' was achieved, this test did this within 72 hours. We retrieved approx. 9cu.in. of diatom material when the test was concluded. This test not only removed all of the diatoms algae but also other algae's, it removed 93% of Nitrogen, 90% of Phosphorus it cleared the water by 95%, creating healthier lake water for the eco system.

1st UV filter test hardware



1st UV filter test results





1st UV filter test water analysis results

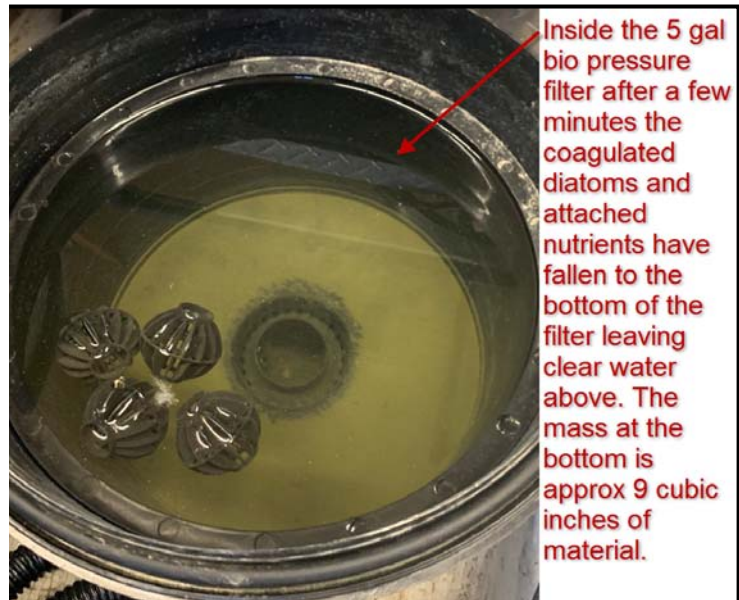
SPRING VALLEY LAKE ASSOCIATION - filter test April 19, 2019			
FILTER: CPF-180/250 UV-C POND BIO PRESSFILTER AMOUNT: TESTED 150 GALLONS			
PUMP SPEED: 30GPM		DURATION: TEST RUN WAS 72 HOURS	
Analysis	Filtered water	Lake water	Description
Synedra sp. (algae) cells/mL	< 40	< 400	Single-celled planktonic
Cynbella sp. (algae) cells/mL	< 40	< 400	Colonial planktonic
Eunotia sp. (diatom) cell/mL	not detectable	335,000	other algae found below 400 cells/mL, Scenedesmus, Pediastrum, Aulacoseira
Total Phosphorus ug/L	23.80	339.80	FILTERED: Moderate amount-Mesotrophic LAKE: High amount - Hypereutrophic
Free Reative Phosphorus ug/L	< 5	< 5	Low
Total Kjeldahl Nitrogen mg/L	0.60	2.80	FILTERED: Low LAKE: Moderately high
Nitrate & Nitrites mg/L	< 0.02	< 0.02	lower than measurable factor
Nitrogen mg/L	0.60	2.80	FILTERED: Low LAKE: Moderate
Cholorophyll a ug/L	< 10	11.30	FILTERED: Low LAKE: Moderate
pH	6.90	6.90	Near Neutral
Dissovled Oxygen mg/L	7.50	7.80	Accetable for freshwater
Conductivity uS/cm	323.00	323.00	Typical for freshwater
Alkalinity mg/L	94.00	95.10	FILTERED: Moderately buffered LAKE: Moderately buffered
Hardness mg/L	77.30	78.00	FILTERED: Moderately hard LAKE: Moderately hard
Turbidity NTU	5.90	86.10	FILTERED: Moderate LAKE: High amount

Although this test was successful we wanted to scale this test up using a higher wattage UV bulb to confirm that the results can happen more efficiently.



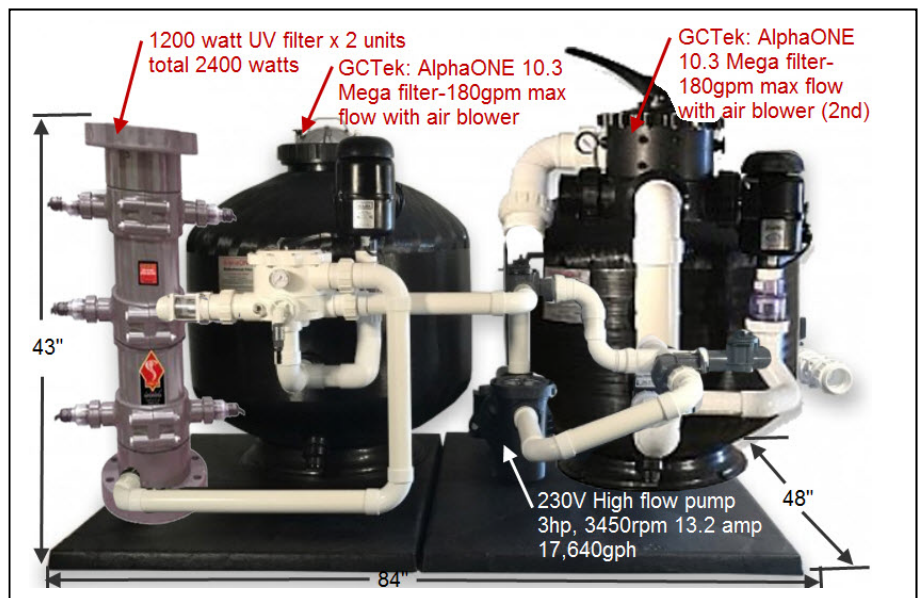
2nd UV Filter test

The second test which was started on May 2, 2019, consisted of the same 5 gallon course filter pack bio pressure filter with a 13watt UV light and a 1/3hp pump, but we added a 55watt UV light. The test conduct with pumping 150 gallons of lake water into a container. We then circulated the 150 gallons at a rate of 10gpm until clarity of over 8' was achieved, this test did this within 20 hours. We retrieved approx. the same 9cu.in. of diatom material when the test was concluded. This test also not only removed all of the diatoms algae but also other algae's, it removed 93% of Nitrogen, 90% of Phosphorus it cleared the water by 95%, creating healthier lake water for the eco system, the results also confirmed that a quicker and more effective time can be achieved with increasing the wattage of the UV filter. The filter and pump systems was the same components as shown in test 1 except with the addition of the 55watt UV shown below.



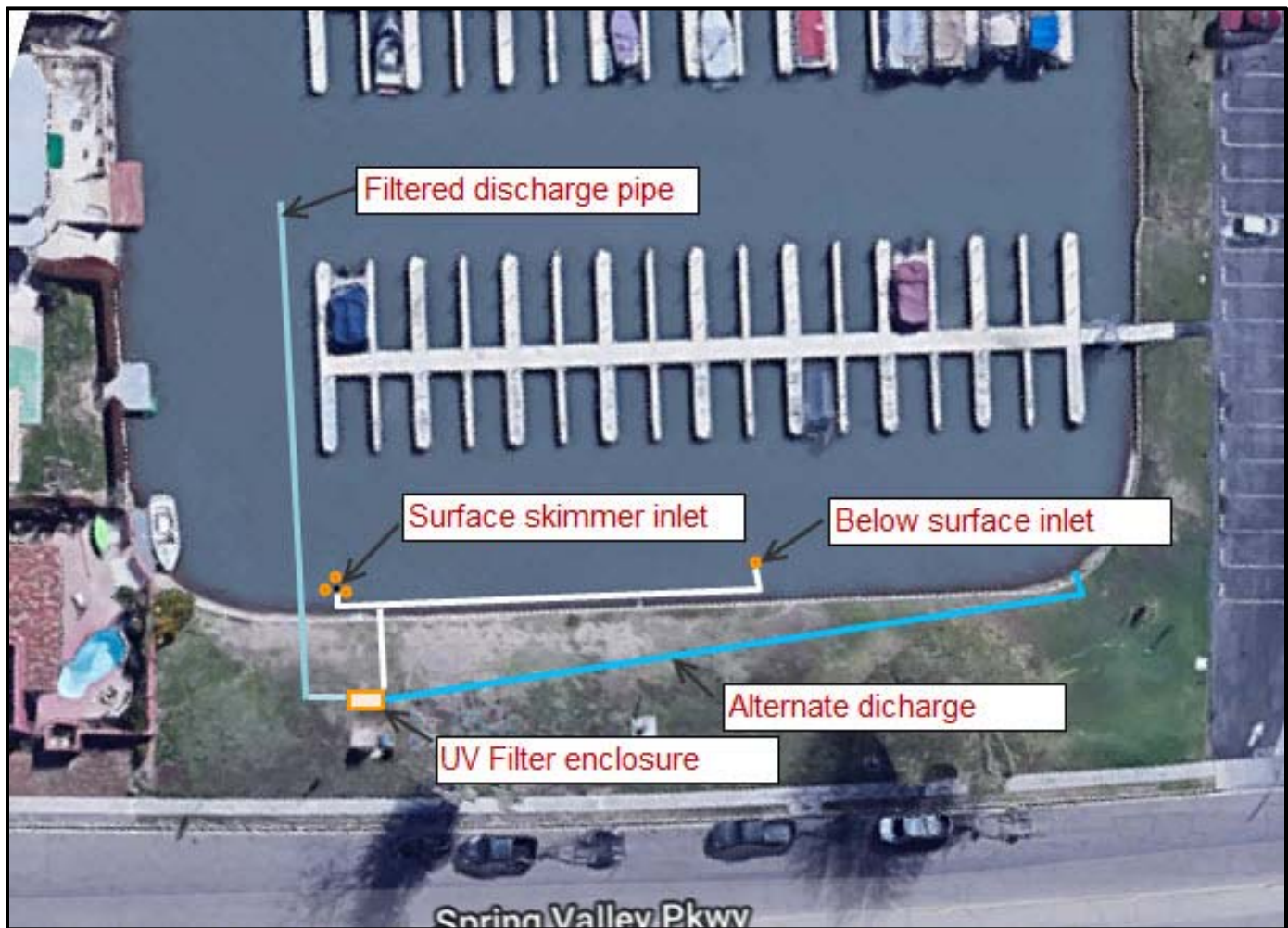
Conclusion

Based on the results from the UV filter test and ability to scale the test up with the same results we have designed a solution system. This system is built to maximize the filtering requirements but stay within power restrictions we currently have at the area these unit can be placed. The filter systems would be placed at each of the 14 fishing areas, at the marina and east beach for a total of 16 systems. These filter systems are designed compact enough not to impede the aesthetics or use of each area with a foot print of only 7' x 4' and enclosed within a nice equipment box this system could run 24/7 with minimal noise until lake clarity is achieved and then timed to keep the lake controlled. The upscale will consist of 2-77 gallon bio pressurized filter packs, 2-1200watt UV filters and 1-3hp high flow pump. This system would be able to filter approx. 290 gallons per minute or 417,600 gallons per day. The



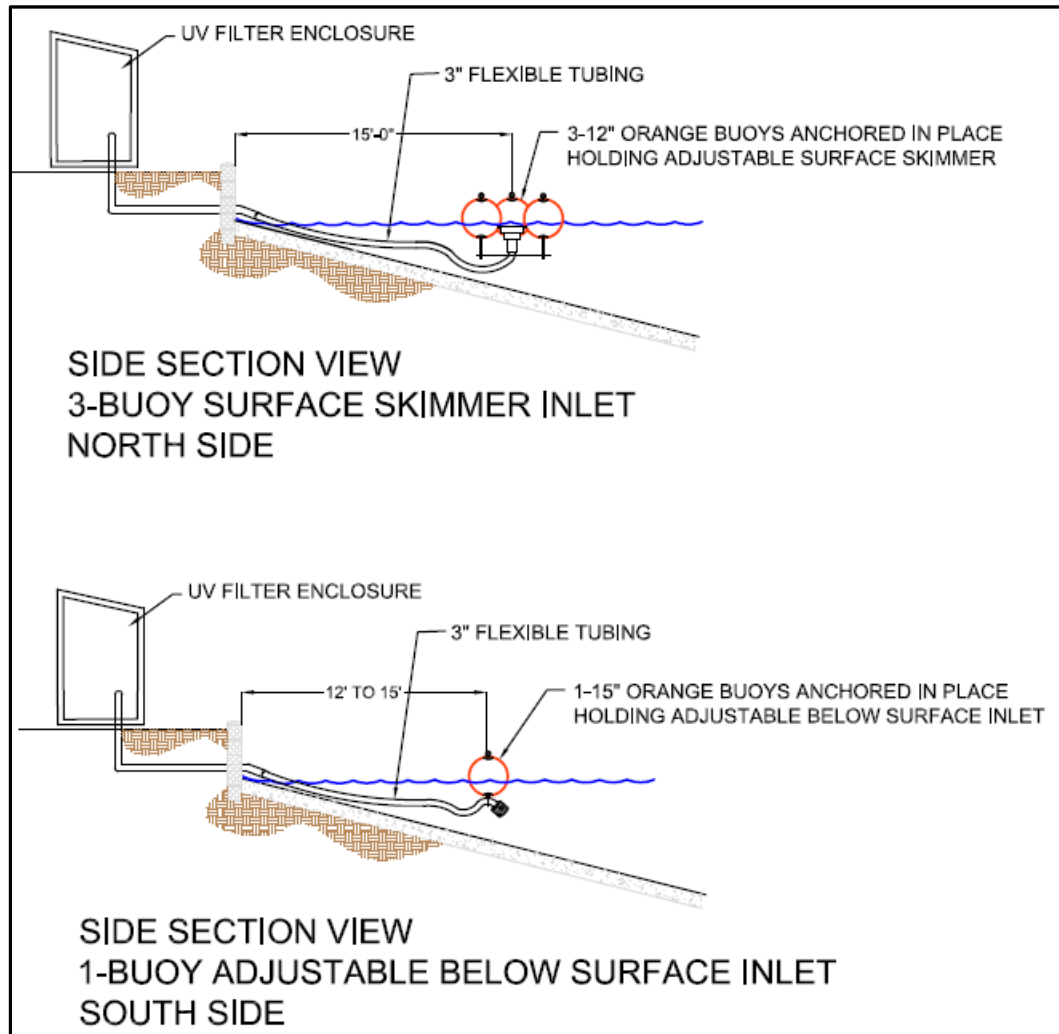


cost of each unit is projected to be \$25,800.00 complete with enclosure. The projected cost to run this filter 24/7 is \$81.08 per year. The inlets would require 2 inlet points approx. 25' to 40' apart that will provide safety from accidental suction lock. It will not allow a person to get stuck on 1 inlet. The inlets will also be strained and be fully adjustable to filter water from any depth. 1 inlet will be a surface skimmer type using 3-12" orange buoys holding the inlet just below the surface but adjustable to 18" below the surface. The 2nd inlet would be set around 24" from the surface and can be adjusted from 2' to the bottom. The discharge or return flow could be used as a water feature or discharged near the bottom away from the inlets. The diagrams below show a standard installation at the marina, but a similar installation would be the same at any area.





This illustration below shows the side section views of the inlets for reference.





The price matrix is below and shows a cost to do an optional lighted waterfall. This discharge would require 4 of the 36" waterfall to accommodate the flow rate.

SPRING VALLEY LAKE ASSOCIATION FISHING AREA FILTER/PUMP			
FILTER: 2-1200 WATT UV's + 2-BIO FILTERS		SINGLE FILTER CAPACITY 417,600GPD - MAX	
PUMP SPEED: 290GPM-MAX		DAYS FOR 16 SYSTEMS TO CYCLE THE LAKE: 85 days	
FILTER/PUMP	QTY	COST	Description
GC Tek AlphaONE filter	2.00	\$ 7,000.00	Media filter 2 req.
1200 Watt UV	2.00	\$ 15,400.00	UV filter 2 req.
3hp High flow pump	1.00	\$ 1,700.00	pump
Stainer and buoy	1.00	\$ 200.00	floating strainer suction
Floating scum skimmer	1.00	\$ 400.00	Scum skimmer 2nd suction point
Piping, base and enclosure	1.00	\$ 1,100.00	
Total	1.00	\$ 25,800.00	5520watts/24-7 = \$81.08 year
16 units around the lake	16.00	\$ 412,800.00	
Maintenance			
10' x 15' Filter bag 150Cuft.	1.00	\$ 120.00	Ultra-Dewatering Bag 9725-O/S 10' x 15'
Optional waterfall discharge			
36" lighted waterfall discharge	4.00	\$ 1,600.00	4 required for discharge amount

Maintenance would require checking the system daily and back flushing the system every 1 to 3 weeks. This process of back flushing would require back flushing the system in to a 10' x 15' filter bag (150 cuft.) into a dewatering filter bag and allowing the filter bag to keep the diatom material and clean water to flow back into the lake. This process would take about 30 minutes at each filter station. The bag would be placed on a barge where the back flushing would take place. The bag would sit for 24 to 48 hours prior to disposing of the diatom material. It is determined that 66 to 132 bags will be required to remove all of the 10,000cuft to 19,913cuft of diatom material from our lake. The dewatering filter bag is shown below.





Clear water is just around the water and the only reoccurring cost will continue to be electricity, maintenance and dewatering filter bags.

