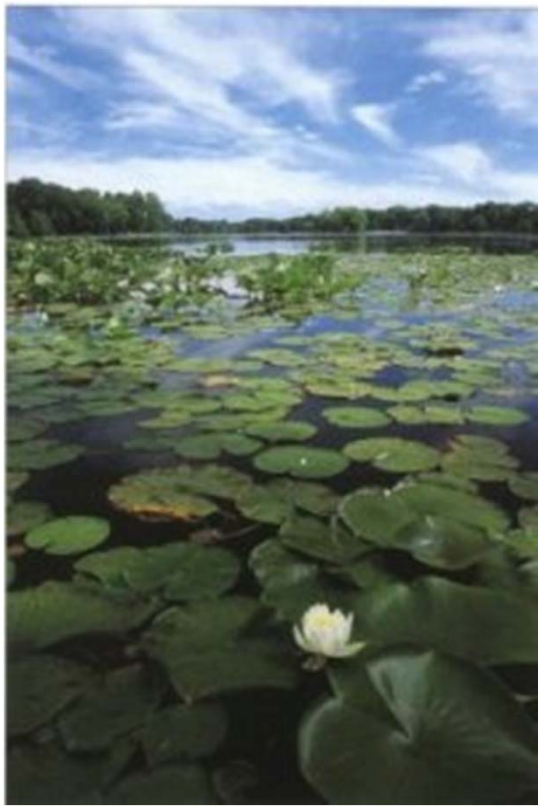


Silver Lake Park Restoration Updated Plan

Silver Lake Estates Board Meeting

September 12, 2016: 7 PM

Topics for Discussion

- Review feedback from August 17 town hall meetings discussing **priority park maintenance needs** (maintenance repair and replacements)*

- Review updated plan for phase 1 priority maintenance and final contractor estimate

- **Take action on project**

Feedback from meeting

1. **Break project into phases** over time to *reduce the annual assessment increase.*

2. Complete project phases using the **accumulated re**serves

3. Publish annual **board meeting schedule** in advance (all meetings are open to all SLE lot owners) to allow interested lot owner to understand project phases

4. Incorporate **lot owner feedback** into planning of each project phase

Park Maintenance Priorities 2016

REVISED PHASE 1

1. Replacement of the **retaining wall between the boathouse and the swim dock**.
   (The plan will **NOT** include creation of a new ADA accessible picnic pod.

2. Replacement of the **timber lake seawall** at the north end of the park with a concrete seawall.

……

LATER PHASES – FINAL SCOPE/TIME/BUDGET …. TBD

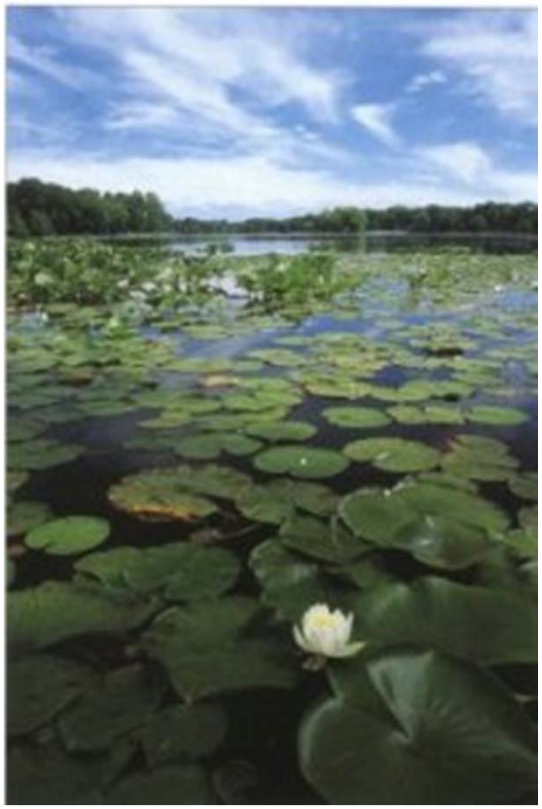
1. Replacement / Repair of the **parking lot** – NOT FINAL

2. Replace timber surrounding all **picnic pods** with uni-lock type landscape blocks (Pod #1 and #2 will be modified to also be ADA accessible.) – NOT FINAL

Park Maintenance – Phase 1

- Revised cost via competitive bids
  - Boathouse retaining wall **$ 67,400**
  - North seawall **$ 86,300**
    - Pod demo replacement (#8 & #9) **$ 5,950**
  - Total **$159,650**

- **Use 2016 SLE cash reserve to fund project cost**
  – what minimum cash reserve is needed?
- A **line of credit** may be used to pay contractors in the event assessment collections / operating expenses impact reserve levels.



Silver Lake Park Restoration

Town Hall for
Silver Lake Estates Lot Owners

August 17, 2016: 3 PM and 7 PM

Topics for Discussion

- Review **priority park maintenance needs** (maintenance repair and replacements)*
- Review **timetable, budget and financing options**
- Review aeration impact on **water quality**

* Under study and due diligence since 2004

Park Maintenance Priorities

1. Replacement / Repair of the **parking lot**.

2. Replacement of the **retaining wall between the boathouse and the swim dock**. The plan will include creation of a space for a new ADA accessible picnic pod.

3. Replacement of the **timber lake seawall** at the north end of the park with a concrete seawall.

4. Replace timber surrounding all **picnic pods** with uni-lock type landscape blocks. (Pod #1 and #2 will be modified to also be ADA accessible.)

SLE 2016 Mailing to Lot Owners on Maintenance Issues

SILVER LAKE ESTATES
BOARD OF TRUSTEES

Please find attached the 2016 SLE budget and the assessment for your SLE lot. The SLE 2016 budget is lower than the 2015 budget (when we budgeted for water quality investments including the replacement aeration system). You will note the 2016 budget includes $80,000 for replacement of the 25 year old **boathouse roof** that currently has six leaks. Half of the cost will be covered from funds on hand and half from funds in the 2016 budget.

The replacement **aeration system** is having very positive impacts on the lake's clarity and other water quality measurements. Silver Lake Village Council is also investing to improve storm water management since it discharges about 90% of the Silver Lake Village's storm water into Silver Lake (along with pollutants from our lawns and our streets). The replacement aeration system is working 24x7x365 and producing nice improvements in water quality readings after only one year of operation. *Like last winter, it is not safe to ice skate on Silver Lake due to the operation of the aeration system.* The replacement aeration system came on-line in October 2014 and under full power in December 2014. Our website has information about the water quality issues affecting all lakes and rivers including Lake Erie and the Cuyahoga River at http://silverlakeestates.com/water%20quality.html

Your SLE Trustees and Advisors are again addressing a long list of **maintenance, repair and replacement items**. The Board in 2016 will continue to work on a prioritized list and likely develop a multi-year plan to address our maintenance needs. The Board will also consider long term financing options to spread the cost over several years. We encourage you to look closely at the park and the boathouse to note the variety of maintenance projects that need to be addressed. You can also see photos of the park and boathouse conditions including the roof leaks on our website at http://silverlakeestates.com/maintenance.htm

In **2015**, the SLE staff completed a repair to the swimming area floating dock that broke in two pieces after many years of use. We also replaced the popular turtle in the children's playground after the former turtle fell apart due to age and the effects of weather over many years. SL lot owners are bringing their children and grandchildren to enjoy SL Park to climb on the turtle and to use the swings, sliding board and other park amenities. The boathouse chimney bricks were repaired above the roof line. The island boat dock was replaced after 50 years of use with a floating dock in sight of the boathouse. SLE replaced the used outboard motor that is used on the used pontoon boat (work boat) this past year. As you may be aware the Trust owns most of the shoreline around the lake anywhere from 3 feet to 80 feet back from the water line (generally to utility poles in lake shore back yards). The pontoon boat was purchased to support maintenance projects including the cost effective removal of dead lakeside trees on Trust property.

Regards

SILVER LAKE ESTATES BOARD OF TRUSTEES

http://silverlakeestates.com/maintenance.htm

MAINTENANCE, REPAIR AND REPLACEMENTS

Several maintenance issue were identified by SLE'S lot owner based Facilities Planning Committee 2004 though 2010 and corrections were planned for 2010-2011 as noted in the 2004 -2010 Newsletters and other letters to the lot owners. Property conditions in 2015 are the same or in most cases are worse.

2015 MAINTENANCE ISSUES

- ***Boathouse roof*** *- leaking due to age*
- ***Boathouse chimney*** *- adding to roof leak and structural issue (above the roof line)*
- ***Boathouse walls and floors*** *in poor condition due to use of only 32" deep footer, location next to a lake and storm water run off from parking lot and from the park.*
- ***Boathouse sanitary sewer line*** *- too shallow, subject to blockage and breakage*
- ***Parking lot*** *- blacktop not properly installed 50 yrs ago, damaged, incorrect grading*
- ***Parking lot curbs and retaining walls****- constructed with used RR ties 40+ years ago*
- ***Retaining wall*** *boathouse to swimming dock - 90+ yrs old and failing*
- ***Park north end retaining wall*** *- constructed with used RR ties, age and insect damage*
- ***Picnic pods*** *- concrete slabs (some of the picnic pod retaining walls have been replaced)*
- ***Need replacement trees*** *for those removed after lightning or insect damage*
- ***Children's playground*** *- needs additional repairs and replacement equipment*
- ***Government regulations and Codes*** *(village, county, region and Federal) impact maintenance, repairs and replacements choices.*
- ***Other safety issues*** *need to be addressed in the park property*

NOTE: SLE trust *requires* the proper maintenance of the property by the Trustees

1920 - 2015 MAINTENANCE:

Original designs, prior maintenance choices, budget limitations impact the appearance of our boathouse and park Some prior maintenance decisions since 1920 were based on first cost, not life cycle cost (i.e. installation of *used* RR ties, only coat of blacktop used)

BOATHOUSE : Roof, Foundation and Walls

Boathouse West wall
Fireplace roof leak
Ladies room ceiling
Ladies room countertop
Ladies room floor
Men's room floor
Men's room floor 1
Men's room floor 2
Bathroom1
Ping-Pong room roof leak
Boathouse footer
Boathouse footer1
Boathouse footer2
Boathouse wall
Guard Room Wall
Ping Pong room wall
Roof1
Roof lakeside
Roof south end - prior structural issues have been resolved
Boathouse Roof S
Boathouse Roof N
Boathouse Roof IR1
Boathouse Roof IR2
Boathouse Roof IR3
Boathouse Roof IR4

PARKING LOT

Curb1
Curb2
Parking Lot1
Parking Lot2
Parking Lot3
Parking Lot4
2015 Parking Lot1
2015 Parking Lot2
2015 Parking Lot3
2015 Parking Lot4
2015 Parking Lot5
2015 Parking Lot6
2015 Parking Lot7
2015 Parking Lot8
2015 Parking Lot9
2015 Parking Lot10
2015 Parking Lot11
2015 Fishing Dock1
Chimney1
Chimney2
Chimney3
Chimney4
Chimney5
Chimney6

PICNIC PODS

picnic pod1
picnic pod2
Picnic pod3
2015 Picnic Pod1
2015 Picnic Pod2
2015 Picnic Pod3

RETAINING WALLS

Retaining wall1
Retaining wall2
Retaining wall3
2015 Children's Playground1
2015 N Retaining wall 1
2015 N Retaining wall 2
2015 Side walk near playground 1
2015 Sidewalk near SL Blvd

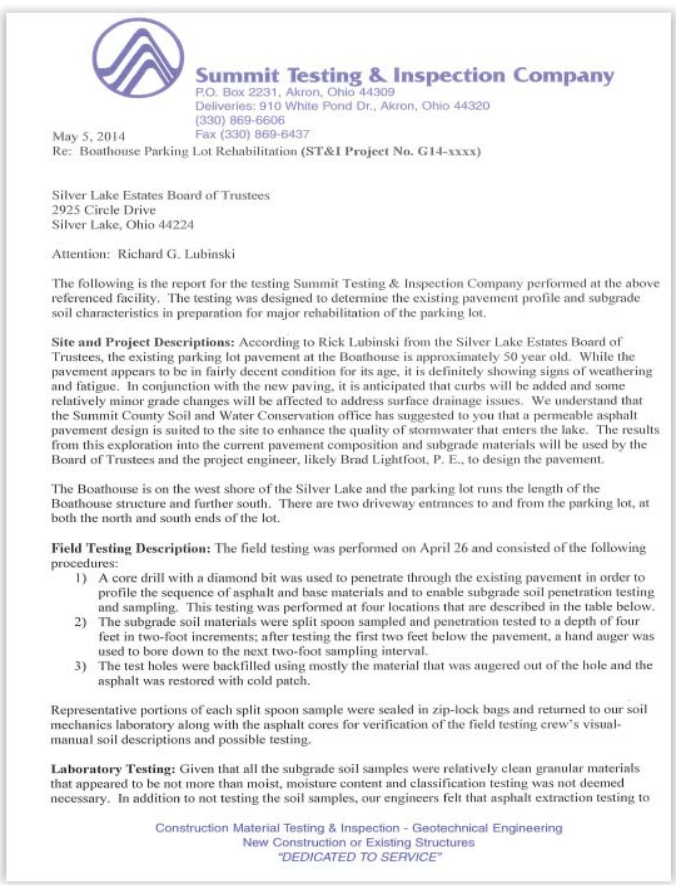
BOAT RAMP AND DOCK

Boat ramp1

Parking Lot

- Existing parking lot is ***over 50 years old*** and was not installed with a underlying blacktop base coat or intermediate coat
(only top coat was installed)

SLE Had Parking Lot Core Drilled and Tested in 2014



Summit Testing & Inspection Company
P.O. Box 2231, Akron, Ohio 44309
Deliveries: 910 White Pond Dr., Akron, Ohio 44320
(330) 869-6606
Fax (330) 869-6437

May 5, 2014
Re: Boathouse Parking Lot Rehabilitation **(ST&I Project No. G14-xxxx)**

Silver Lake Estates Board of Trustees
2925 Circle Drive
Silver Lake, Ohio 44224

Attention: Richard G. Lubinski

The following is the report for the testing Summit Testing & Inspection Company performed at the above referenced facility. The testing was designed to determine the existing pavement profile and subgrade soil characteristics in preparation for major rehabilitation of the parking lot.

Site and Project Descriptions: According to Rick Lubinski from the Silver Lake Estates Board of Trustees, the existing parking lot pavement at the Boathouse is approximately 50 year old. While the pavement appears to be in fairly decent condition for its age, it is definitely showing signs of weathering and fatigue. In conjunction with the new paving, it is anticipated that curbs will be added and some relatively minor grade changes will be affected to address surface drainage issues. We understand that the Summit County Soil and Water Conservation office has suggested to you that a permeable asphalt pavement design is suited to the site to enhance the quality of stormwater that enters the lake. The results from this exploration into the current pavement composition and subgrade materials will be used by the Board of Trustees and the project engineer, likely Brad Lightfoot, P. E., to design the pavement.

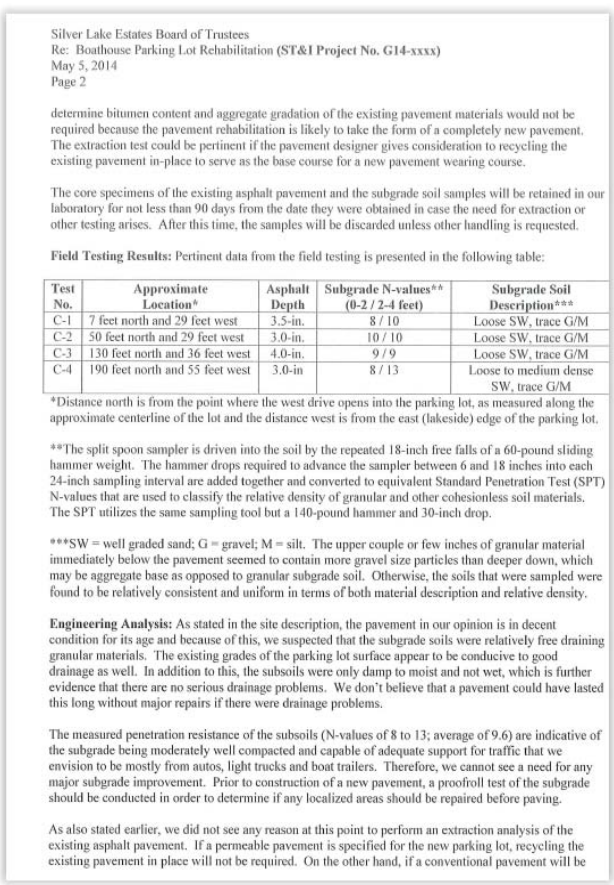
The Boathouse is on the west shore of the Silver Lake and the parking lot runs the length of the Boathouse structure and further south. There are two driveway entrances to and from the parking lot, at both the north and south ends of the lot.

Field Testing Description: The field testing was performed on April 26 and consisted of the following procedures:

1) A core drill with a diamond bit was used to penetrate through the existing pavement in order to profile the sequence of asphalt and base materials and to enable subgrade soil penetration testing and sampling. This testing was performed at four locations that are described in the table below.
2) The subgrade soil materials were split spoon sampled and penetration tested to a depth of four feet in two-foot increments; after testing the first two feet below the pavement, a hand auger was used to bore down to the next two-foot sampling interval.
3) The test holes were backfilled using mostly the material that was augered out of the hole and the asphalt was restored with cold patch.

Representative portions of each split spoon sample were sealed in zip-lock bags and returned to our soil mechanics laboratory along with the asphalt cores for verification of the field testing crew's visual-manual soil descriptions and possible testing.

Laboratory Testing: Given that all the subgrade soil samples were relatively clean granular materials that appeared to be not more than moist, moisture content and classification testing was not deemed necessary. In addition to not testing the soil samples, our engineers felt that asphalt extraction testing to



determine bitumen content and aggregate gradation of the existing pavement materials would not be required because the pavement rehabilitation is likely to take the form of a completely new pavement. The extraction test could be pertinent if the pavement designer gives consideration to recycling the existing pavement in-place to serve as the base course for a new pavement wearing course.

The core specimens of the existing asphalt pavement and the subgrade soil samples will be retained in our laboratory for not less than 90 days from the date they were obtained in case the need for extraction or other testing arises. After this time, the samples will be discarded unless other handling is requested.

Field Testing Results: Pertinent data from the field testing is presented in the following table:

Test No.	Approximate Location*	Asphalt Depth	Subgrade N-values** (0-2 / 2-4 feet)	Subgrade Soil Description***
C-1	7 feet north and 29 feet west	3.5-in.	8 / 10	Loose SW, trace G/M
C-2	50 feet north and 29 feet west	3.0-in.	10 / 10	Loose SW, trace G/M
C-3	130 feet north and 36 feet west	4.0-in.	9 / 9	Loose SW, trace G/M
C-4	190 feet north and 55 feet west	3.0-in	8 / 13	Loose to medium dense SW, trace G/M

*Distance north is from the point where the west drive opens into the parking lot, as measured along the approximate centerline of the lot and the distance west is from the east (lakeside) edge of the parking lot.

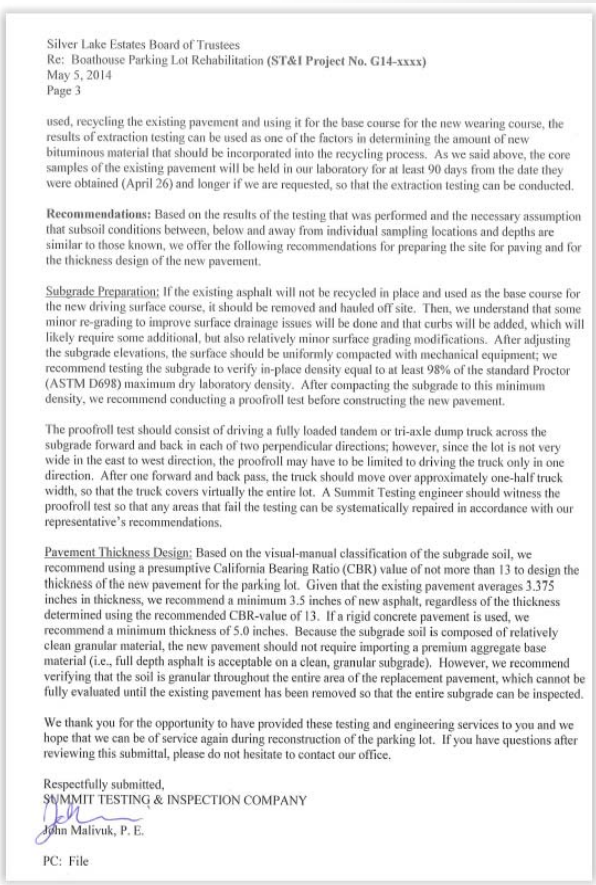
**The split spoon sampler is driven into the soil by the repeated 18-inch free falls of a 60-pound sliding hammer weight. The hammer drops required to advance the sampler between 6 and 18 inches into each 24-inch sampling interval are added together and converted to equivalent Standard Penetration Test (SPT) N-values that are used to classify the relative density of granular and other cohesionless soil materials. The SPT utilizes the same sampling tool but a 140-pound hammer and 30-inch drop.

***SW = well graded sand; G = gravel; M = silt. The upper couple or few inches of granular material immediately below the pavement seemed to contain more gravel size particles than deeper down, which may be aggregate base as opposed to granular subgrade soil. Otherwise, the soils that were sampled were found to be relatively consistent and uniform in terms of both material description and relative density.

Engineering Analysis: As stated in the site description, the pavement in our opinion is in decent condition for its age and because of this, we suspected that the subgrade soils were relatively free draining granular materials. The existing grades of the parking lot surface appear to be conducive to good drainage as well. In addition to this, the subsoils were only damp to moist and not wet, which is further evidence that there are no serious drainage problems. We don't believe that a pavement could have lasted this long without major repairs if there were drainage problems.

The measured penetration resistance of the subsoils (N-values of 8 to 13; average of 9.6) are indicative of the subgrade being moderately well compacted and capable of adequate support for traffic that we envision to be mostly from autos, light trucks and boat trailers. Therefore, we cannot see a need for any major subgrade improvement. Prior to construction of a new pavement, a proofroll test of the subgrade should be conducted in order to determine if any localized areas should be repaired before paving.

As also stated earlier, we did not see any reason at this point to perform an extraction analysis of the existing asphalt pavement. If a permeable pavement is specified for the new parking lot, recycling the existing pavement in place will not be required. On the other hand, if a conventional pavement will be



used, recycling the existing pavement and using it for the base course for the new wearing course, the results of extraction testing can be used as one of the factors in determining the amount of new bituminous material that should be incorporated into the recycling process. As we said above, the core samples of the existing pavement will be held in our laboratory for at least 90 days from the date they were obtained (April 26) and longer if we are requested, so that the extraction testing can be conducted.

Recommendations: Based on the results of the testing that was performed and the necessary assumption that subsoil conditions between, below and away from individual sampling locations and depths are similar to those known, we offer the following recommendations for preparing the site for paving and for the thickness design of the new pavement.

Subgrade Preparation: If the existing asphalt will not be recycled in place and used as the base course for the new driving surface course, it should be removed and hauled off site. Then, we understand that some minor re-grading to improve surface drainage issues will be done and that curbs will be added, which will likely require some additional, but also relatively minor surface grading modifications. After adjusting the subgrade elevations, the surface should be uniformly compacted with mechanical equipment; we recommend testing the subgrade to verify in-place density equal to at least 98% of the standard Proctor (ASTM D698) maximum dry laboratory density. After compacting the subgrade to this minimum density, we recommend conducting a proofroll test before constructing the new pavement.

The proofroll test should consist of driving a fully loaded tandem or tri-axle dump truck across the subgrade forward and back in each of two perpendicular directions; however, since the lot is not very wide in the east to west direction, the proofroll may have to be limited to driving the truck only in one direction. After one forward and back pass, the truck should move over approximately one-half truck width, so that the truck covers virtually the entire lot. A Summit Testing engineer should witness the proofroll test so that any areas that fail the testing can be systematically repaired in accordance with our representative's recommendations.

Pavement Thickness Design: Based on the visual-manual classification of the subgrade soil, we recommend using a presumptive California Bearing Ratio (CBR) value of not more than 13 to design the thickness of the new pavement for the parking lot. Given that the existing pavement averages 3.375 inches in thickness, we recommend a minimum 3.5 inches of new asphalt, regardless of the thickness determined using the recommended CBR-value of 13. If a rigid concrete pavement is used, we recommend a minimum thickness of 5.0 inches. Because the subgrade soil is composed of relatively clean granular material, the new pavement should not require importing a premium aggregate base material (i.e., full depth asphalt is acceptable on a clean, granular subgrade). However, we recommend verifying that the soil is granular throughout the entire area of the replacement pavement, which cannot be fully evaluated until the existing pavement has been removed so that the entire subgrade can be inspected.

We thank you for the opportunity to have provided these testing and engineering services to you and we hope that we can be of service again during reconstruction of the parking lot. If you have questions after reviewing this submittal, please do not hesitate to contact our office.

Respectfully submitted,
SUMMIT TESTING & INSPECTION COMPANY

John Malivuk, P. E.

PC: File

Parking Lot - *Repairs*

- Remove all **timber curbs** on the West side of the parking lot and re-grade.
- Remove all **timber walls** on the North side of the parking lot and replace with 8 inch concrete extended curbs of approximately 18 inches on average in height.
- Remove all **timber curbs** on the East side of the parking lot and replace with 6 inch standard curbs.
- Provide and install a **storm water inlet** over the existing 36 inch storm sewer pipe and center on the parking lot.
- *Provide full depth pavement replacement over top of the existing storm sewer and repair the gaps in the storm sewer pipe. This work to be completed by the Village of Silver Lake.*
- Grind pavements at all drive and sidewalk transitions.

Parking Lot - *Repairs*

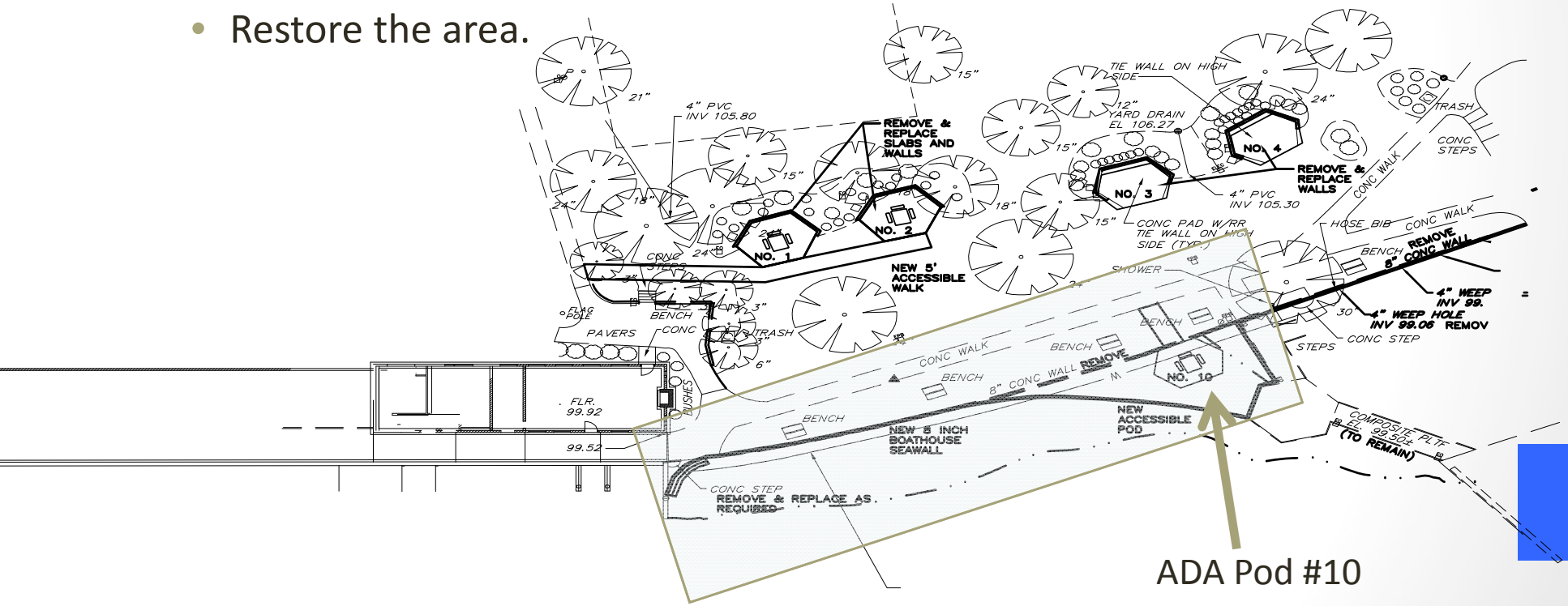
- Provide **asphalt topping** varying in thickness from 1-1/4 inch minimum to a 3 inch maximum to provide positive flow to the new catch basin.
- **Repair erosion** behind the existing retaining wall, re-grade and restore.
- Revise the **sanitary sewer casting** to accommodate the new grades as required.
- Provide a 5 foot wide **sidewalk** to accommodate the child access to the fishing dock.
- Provide an 8 inch concrete pad for the trash **dumpster**.
- Replace the **bike storage** area with a new concrete slab.
- Remove any **vegetation** necessary to accommodate the new sidewalk.
- **Stripe** the parking lot with a revised parking space layout.
- **Restore** all surrounding areas.

Boathouse /Swim Dock Retaining Wall

- Severe spalling, unsafe exposed rebar, leaning and washout

Boathouse / Swim Dock Retaining Wall *Replacement*

- Remove existing concrete **lakeside retaining wall.**
- Install new concrete retaining wall to the new layout (including space for a new Pod # 10.) < flat space for senior citizens and ADA>
- Provide premium backfill for the ADA Pod # 10.
- Restore the area.



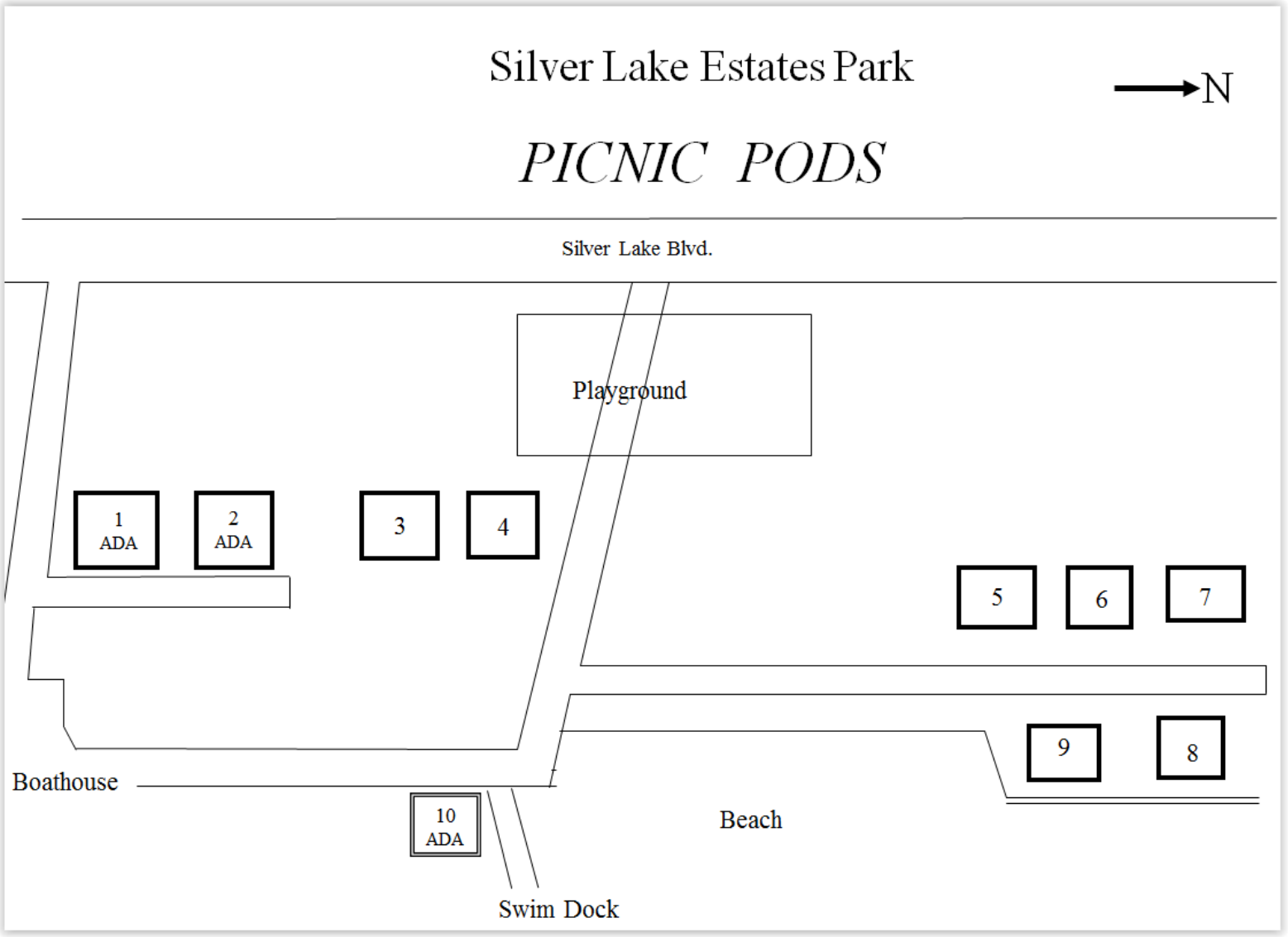
North Lakeside Retaining Wall

- Severe rotting **timbers**, erosion and washout

North Lakeside Retaining Wall
Replacement

- Remove the existing **timber** retaining walls and replace with new tiered retaining concrete modular walls.
- Provide all necessary premium backfill as required.
- Restore the area.

SLE's PICNIC PODs



Picnic Pods

- Rotting vertical and in-ground **timbers**, severe cracks in pads
- Replacement of north seawall will require adjacent concrete pad replacement (#8 and #9)
- Remove in-ground **timbers** adjacent to north end pads

Picnic Pods - *Repairs*

- Remove all existing **timber walls** and curbs on Pod Nos. 3 thru 7and replace with new retaining concrete modular walls.
- Remove all existing **timber walls** and concrete slabs on Pod # 1, 2, 8, & 9 and replace with new retaining concrete modular walls, and concrete slabs as required. Pod # 1 and # 2 are to be ADA accessible areas.
- Install ADA Pod # 10
- Provide 5 foot wide concrete sidewalks to accommodate the ADA accessible areas at Pod # 1 and # 2
- Restore all areas.

Park Maintenance - Cost Estimate

- Cost Estimate (via competitive bids)

• Parking lot	**$130,857**
• Boathouse retaining wall	**$111,210**
• North seawall	**$ 73,432**
• Picnic pods	**$183,942**
• Engineering, project management	**$ 30,120** *
Total	**$537,540**

- **Use $100,000 cash, finance balance over 5 budget years**
- **'Average' annual assessment increase is projected to be $188/yr. per lot, (actual will be based on Trust assessment formula, based on land value)**
- *Allowance: SLE's Lake Manager will provide day to day project management

COST ESTIMATES WITH OPTIONS FOR LONG LIFE AND SHORT LIFE MATERIALS

SILVER LAKES ESTATES
SILVER LAKE, OHIO
2016 SITE REHABILITATION
CHEMSTRESS PROJECT NUMBER: 7473
PROJECT BUDGET ESTIMATE REV 1 - 7/7/16

AREA	DESCRIPTION	ALTERNATE A BUDGET	ALTERNATE B BUDGET	ALTERNATE C BUDGET
1	PARKING LOT REHABILITATION	$130,857	$138,836	$121,441
2	PICNIC POD REHABILITATION	$111,210	$88,915	
3	BOATHOUSE SEAWALL	$73,432		
4	NORTH SEAWALL	$183,942	$140,382	
	2016 SITE REHABILITATION TOTALS			
	MAXIMUM PROJECT CONSTRUCTION BUDGET	$507,420		
	MINIMUM PROJECT CONSTRUCTION BUDGET	$424,170		
	ENGINEERING COSTS:			
	PRELIMINARY ENGINEERING (TO DATE)	$17,550		
	BID/CONSTRUCTION GUIDELINES	$7,770		
	CONSTRUCTION CONSULTATION	$4,800		
	TOTAL ENGINEERING	30,120		
	PROJECT TOTALS:			
	MAXIMUM PROJECT CONSTRUCTION BUDGET	$ 537,540		
	MINIMUM PROJECT CONSTRUCTION BUDGET	$ 454,290		

ENGINEER'S DETAILED COST ESTIMATING

SILVER LAKE, OHIO
2016 SITE REHABILITATION
CHEMSTRESS PROJECT NUMBER: 7473
PROJECT BUDGET ESTIMATE REV 2 - 7/11/16

	DESCRIPTION	QUANTITY	UNITS	UNIT COST	ALTERNATE A COST	ALTERNATE B COST	ALTERNATE C COST
1	**PARKING LOT REHABILITATION**						
	SITE EXCAVATION	100	CY	$10.00	$1,000	$1,000	$1,000
	TIMBER WALLS & CURBS TO BE REMOVED	450	LF	$7.50	$3,375	$3,375	$3,375
	VEGETATION REMOVED	27	EA	$25.00	$0	$675	$0
	TREE REMOVED	1	EA	$250.00	$0	$250	$0
	FULL DEPTH PAVEMENT REPLACEMENT INCL STONE BA	75	CY	$165.00	$12,375	$12,375	$12,375
	ASPHALT PAVEMENT PLANING	81	SY	$2.00	$162	$162	$162
	ASPHALT PAVEMENT RESURFACING	224	CY	$225.00	$50,400	$50,400	$50,400
	STRIPING	1683	LF	$0.65	$1,094	$1,094	$1,094
	6 INCH CONCRETE CURBING	380	LF	$25.00	$9,500	$9,500	$0
	8 INCH EXTENDED CONCRETE CURBS (18 INCH HIGH)	216	LF	$58.00	$12,528	$12,528	$12,528
	5 FOOT CONCRETE SIDEWALK (ALTERNATE)	128	LF	$40.00	$0	$5,120	$0
	8 INCH CONCRETE DUMPSTER PAD	3	CY	$500.00	$1,500	$1,500	$1,500
	CONCRETE SLAB FOR BIKE STORAGE	2	CY	$500.00	$1,000	$1,000	$1,000
	STORM WATER INLET (ODOT 2-3)	1	EA	$1,500.00	$1,500	$1,500	$0
	SANITARY STRUCTURES MODIFIED	1	EA	$350.00	$350	$350	$0
	STORM WATER POLLUTION PROTECTION	400	LF	$0.75	$300	$300	$300
	SITE RESTORATION & SEEDING	2700	SF	$1.50	$4,050	$4,050	$4,050
	MISCELLANEOUS	1	LS	$9,913.40	$9,913	$10,518	$10,518
	OVERHEAD AND PROFIT	1	LS	$21,809.47	$21,809	$23,139	$23,139
	PARKING LOT TOTALS				**$130,857**	**$138,836**	**$121,441**
2	**PICNIC POD REHABILITATION**						
	SITE EXCAVATION	100	CY	$10.00	$1,000	$1,000	
	STRUCTURES REMOVED	1	LS	$5,000.00	$5,000	$5,000	
	CONCRETE SLABS	22	CY	$500.00	$11,000	$11,000	
	PREMIUM BACKFILL	100	CY	$35.00	$3,500	$3,500	
	TIMBER RETAINING WALLS	1126	SF	$35.00	$0	$39,410	
	MODULAR RETAINING WALLS	1126	SF	$50.00	$56,300	$0	
	CONCRETE SIDEWALKS	100	LF	$40.00	$4,000	$4,000	
	SITE RESTORATION & SEEDING	2300	SF	$1.50	$3,450	$3,450	
	MISCELLANEOUS	1	LS	$8,425.00	$8,425	6,736	
	OVERHEAD AND PROFIT	1	LS	$18,535.00	$18,535	14,819	
	PICNIC POD TOTALS				**$111,210**	**$88,915**	
3	**BOATHOUSE SEAWALL**						
	SITE EXCAVATION	185	CY	$10.00	$1,850		
	STRUCTURES REMOVED	1	LS	$5,000.00	$5,000		
	PREMIUM BACKFILL	243	CY	$35.00	$8,505		
	CONCRETE RETAINING WALL	36	CY	$1,000.00	$36,000		
	SITE RESTORATION & SEEDING	2850	SF	$1.50	$4,275		
	MISCELLANEOUS	1	LS	$5,563.00	$5,563		
	OVERHEAD AND PROFIT	1	LS	$12,238.60	$12,239		
	BOATHOUSE SEAWALL TOTALS				**$73,432**		
4	**NORTH SEAWALL**						
	SITE EXCAVATION	280	CY	$10.00	$2,800	$2,800	
	STRUCTURES REMOVED	1	LS	$10,000.00	$10,000	$10,000	
	PREMIUM BACKFILL	280	CY	$35.00	$9,800	$9,800	
	TIMBER RETAINING WALLS	2200	SF	$35.00	$0	$77,000	
	MODULAR RETAINING WALLS	2200	SF	$50.00	$110,000	$0	
	SITE RESTORATION & SEEDING	4500	SF	$1.50	$6,750	$6,750	
	MISCELLANEOUS	1	LS	$13,935.00	$13,935	10,635	
	OVERHEAD AND PROFIT	1	LS	$30,657.00	$30,657	23,397	
	NORTH SEAWALL TOTALS				**$183,942**	**$140,382**	

Park Maintenance - *Project Timing*

- Project will begin following close of season (after 9/1/2016)
- Estimated Construction Period: 6- 8 Weeks
- Project is expected to be completed prior to opening of 2017 season

Next Steps

- SLE Trustees to review **bids** from contractors and select final contractor(s) offering the best price and value (Engineering specifications prepared by Chemstress)
- Finalize A 5 Year Bank Loan
- Initiate project

Water Quality

Project Results

Characteristics of a Healthy Lake and How Silver Lake Compares

Water Transparency

Water transparency in Silver Lake improved dramatically between 2014-2016, following aerator installation. Water clarity typically improves with decreases in sediment and nutrient transport as well as reduced algal growth.

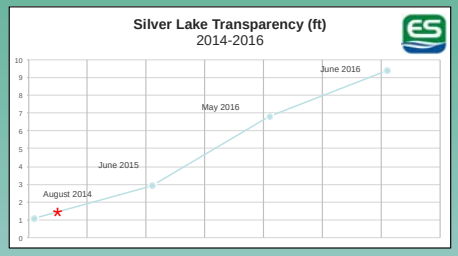


Table 1. Silver Lake Water Clarity (Secchi Disk) in measurements of feet * indicates installation of aeration system in September 2014.

Nutrients Entering from the Watershed

Nutrients are substances that provide nourishment essential for growth and the maintenance of life. Nutrients include phosphorous and nitrogen, two of the major nutrients that contribute to algae blooms when they occur in excess..

Nutrient loading, or the process of nutrients being transported by stormwater runoff into a body of water, can cause nuisance algal growth which may release harmful toxins. Limiting the amount of stormwater runoff using best management practices such as rain barrels, limited lawn mowing and fertilization, and permeable surfaces can help protect our lake ecosystems from harmful algae.

Clean Water Tips: How can you fertilize and help keep our waters clean?

- Use fertilizer sparingly.
- Don't fertilize before a rain storm.
- Use organic fertilizers that release nutrients more slowly.
- Have your soil tested before applying fertilizers to your lawn and gardens. .

Few, if any, Blue-Green Algae Blooms with Little or No Algal Toxin

Blue-green algae (measured as Chlorophyll a, a pigment produced by blue-green algae) and algal toxins (microcystin) have decreased dramatically over the last three years, following addition of aerators to the lake. These metrics are both recorded as concentrations, in parts per billion (ppb). An example of 1 ppb is a drop of water in an Olympic-sized swimming pool.

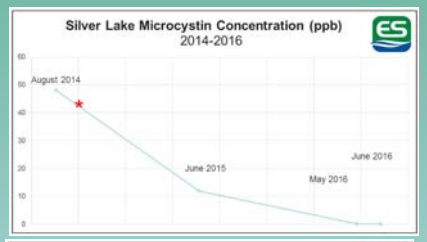


Table 2. Silver Lake Microcystin Concentration in parts per billion (ppb) * indicates installation of aeration system in September 2014.

Table 3. Silver Lake Chlorophyll a Concentration in parts per billion (ppb). * indicates installation of aeration system in September 2014.

Stable and Naturalized Shoreline

A stable, naturalized shoreline helps prevent erosion from the lake's surrounding land. Erosion transports sediments and nutrients to the water, making the lake not only murkier but also fueling the growth of blue-green algae

Diverse and Healthy Fishery

When a lake is healthy, the life within it thrives as well. Diverse fish populations can, in turn, help keep the ecosystem balanced and support recreational fishing opportunities.

Diverse and Healthy Rooted Aquatic Plant Community

Aquatic plants in Silver Lake are important because they:

- **Provide food and habitat for birds and aquatic life in the lake**
- **Provide cover for young fish and amphibians**
- **Increase oxygen in the lake**
- **Help protect shorelines from erosion and improve water clarity by stabilizing sediments**
- **Improve water quality by using nutrients like phosphorous and nitrogen that might otherwise help fuel excessive growth of undesirables.**

EnviroScience
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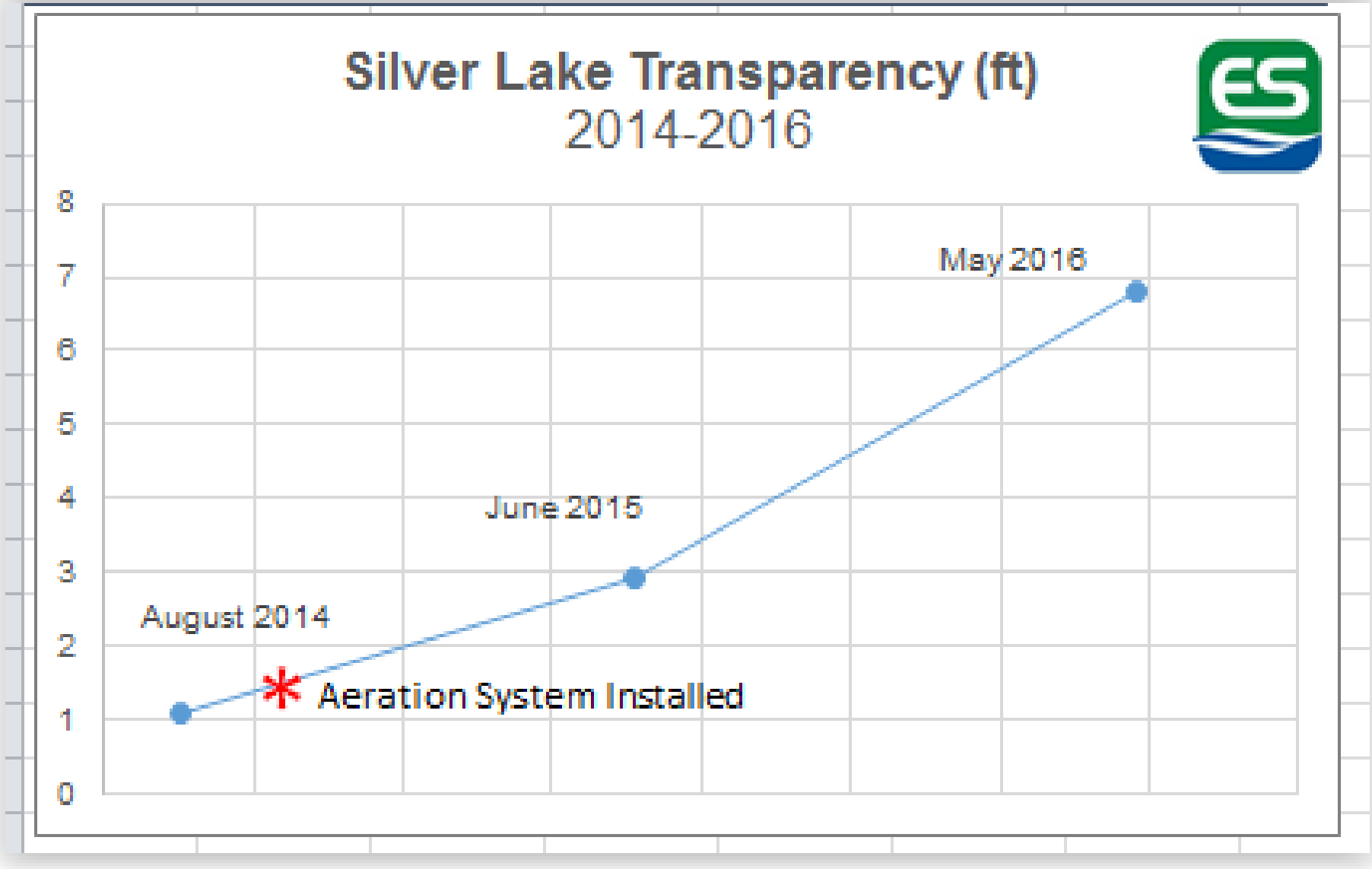
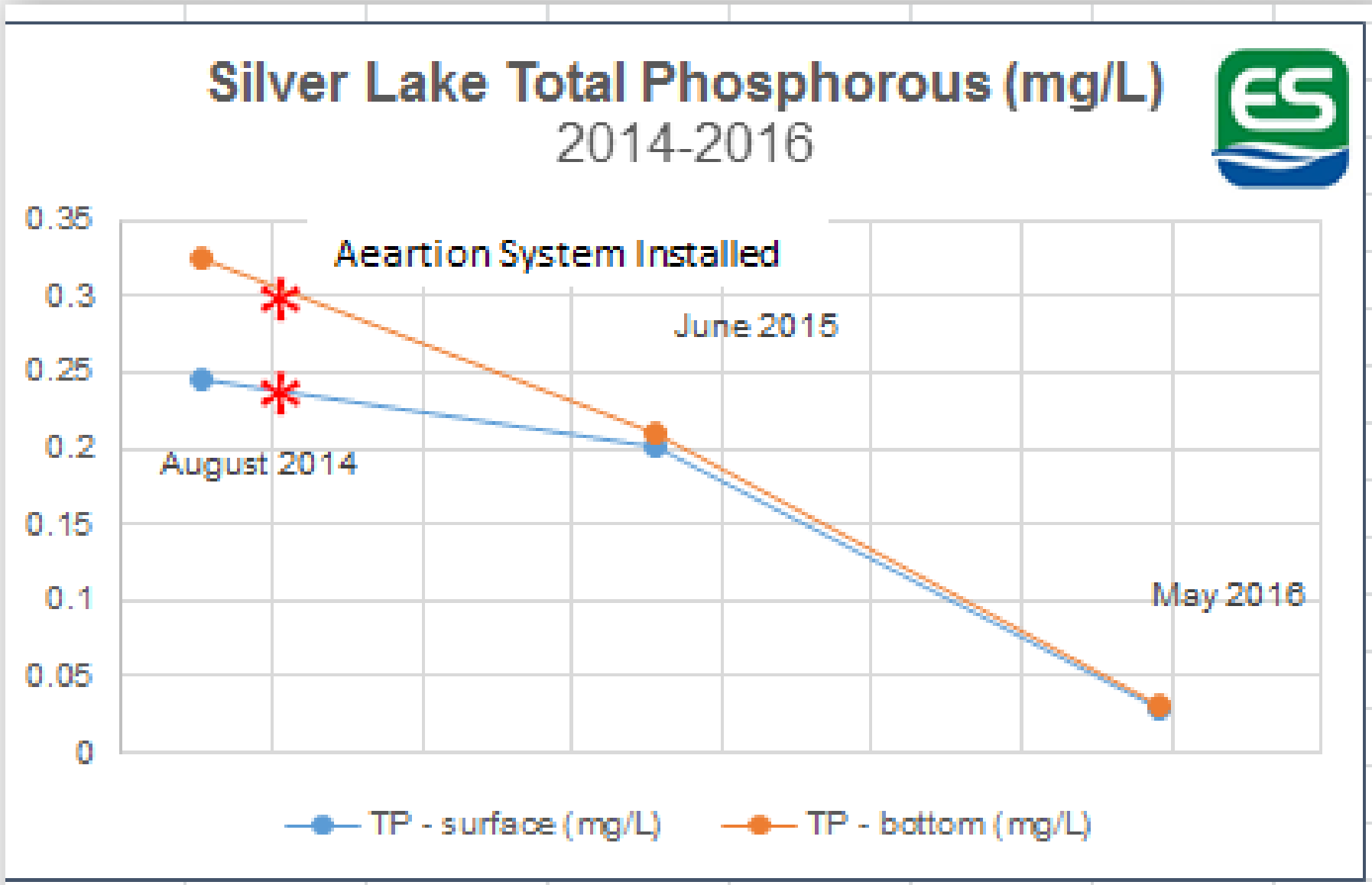
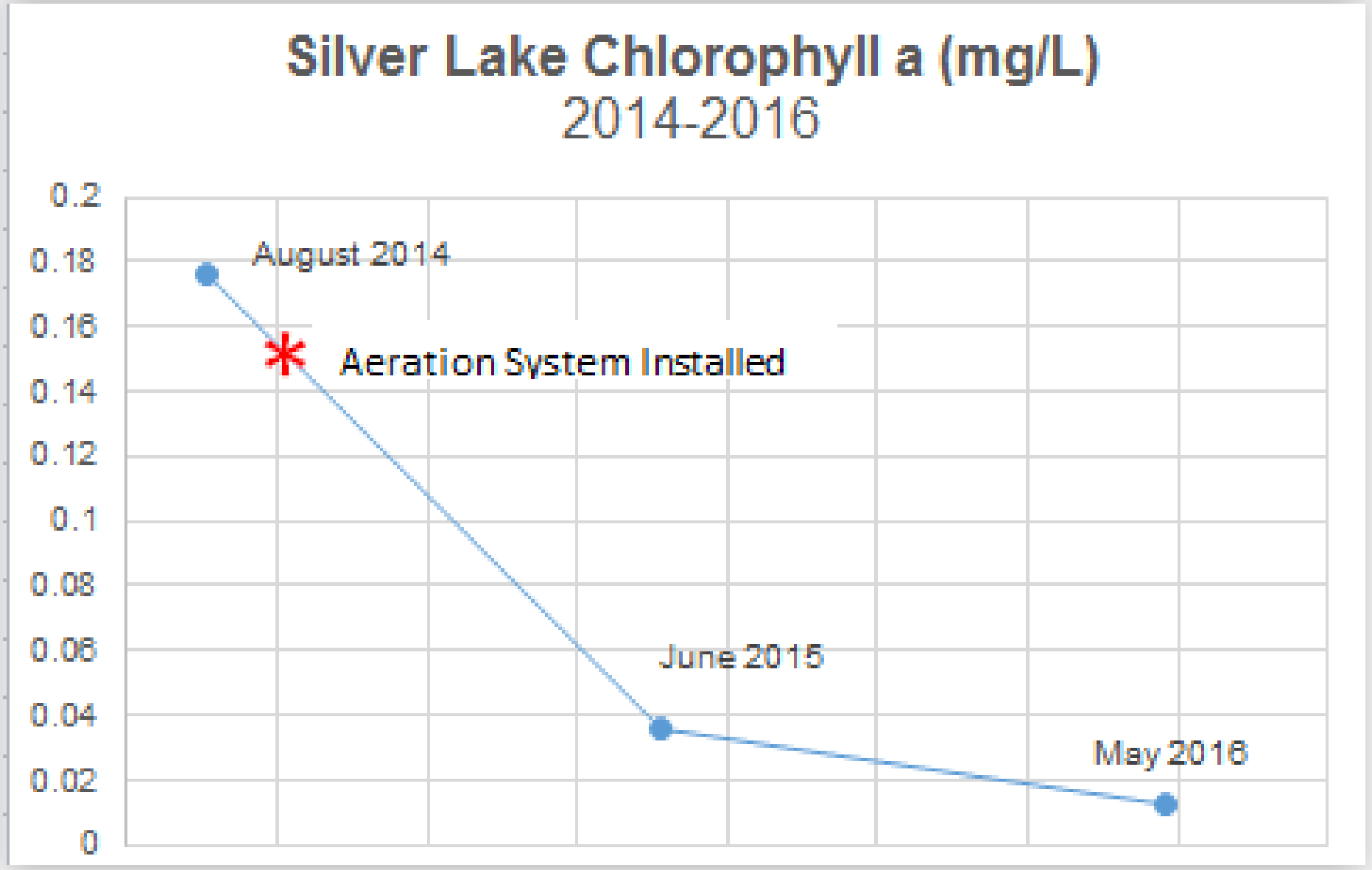
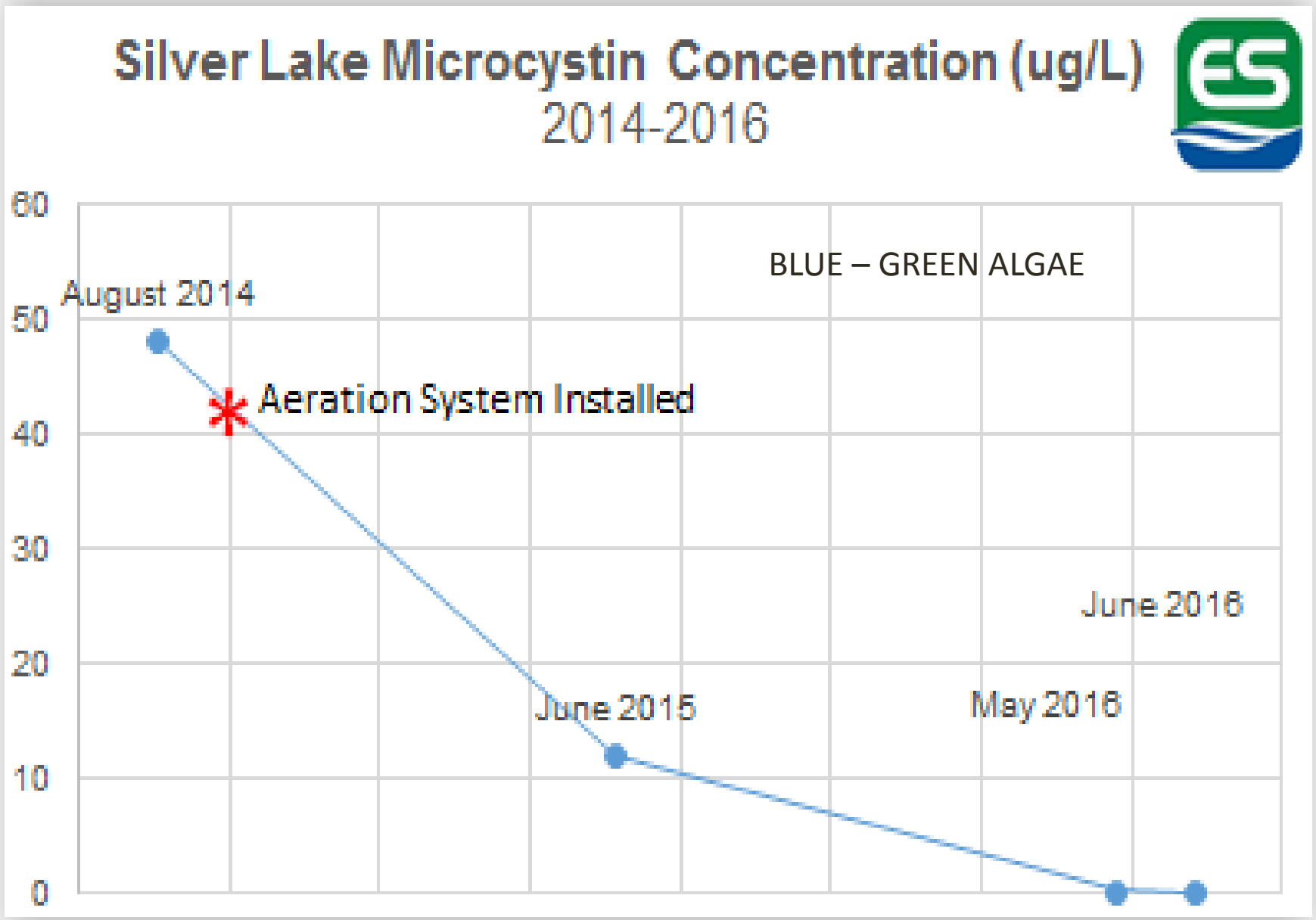

Silver Lake Transparency (ft)
2014-2016
8
7
6
5
4
3
2
1
0
May 2016
June 2015
August 2014
Aeration System Installed


Silver Lake Total Phosphorous (mg/L)
2014-2016
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Aeartion System Installed
June 2015
August 2014
May 2016
TP - surface (mg/L)
TP - bottom (mg/L)


Silver Lake Chlorophyll a (mg/L)
2014-2016
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
August 2014
Aeration System Installed
June 2015
May 2016


Silver Lake Microcystin Concentration (ug/L)
2014-2016
BLUE – GREEN ALGAE
60
50
40
30
20
10
0
August 2014
Aeration System Installed
June 2015
May 2016
June 2016

For More Information

Silver Lake Estates

- Home Page
- Welcome Letter
- Special Events
- Weekly Events
- Picnic Pod Reservations
- Office
- Board
- Staff
- Rules
- Safety
- Boat Storage
- Photos
- Fishing
- Water Quality
- Maintenance Issues

WATER QUALITY

SLE has been active in water quality (WQ) efforts since the 1970s resulting in the installation of the original lake aeration system in 1981. SLE has been guided by Biology PhDs from Kent State University, University of Akron, and by EnviroSciences Corp. KSU is considered a world leader in lake restoration and WQ matters. Several biologists from EnviroScience formerly worked for the Ohio EPA.

Two environmental Masters Thesis have been written on Silver Lake (1980 and 2013). Another environmental Masters Thesis was written in 2015 by the University of Akron focused on the sediment under Silver Lake.

SLE, SLV, Summit Soil and Water Conservation District (SSWCD) and Ohio EPA other groups are joining forces to provide education on water quality including discouraging the use of PHOSPHORUS lawn fertilizers and encouraging storm water management. Storm water management is a major part of the solution for better water quality.

In 2012 SLE hired EnviroScience to conduct another major study of the water, plants and fish population
EnviroScience 2013 report - Executive Summary

In 2013 Silver Lake Village's Mayor and Council discussed proposed legislation to ban lawn fertilizers containing PHOSPHORUS that is well known to support algae growth in rivers and lakes. Eventually SLV Council elected to support lot owner education to **discourage the use of lawn fertilizers that contain PHOSPHORUS.**

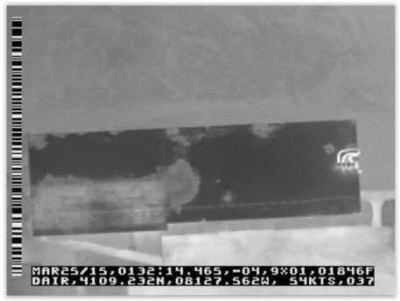
In 2014 SLE decided to replace its 33 year old aeration system with the latest technology after a two year investigation

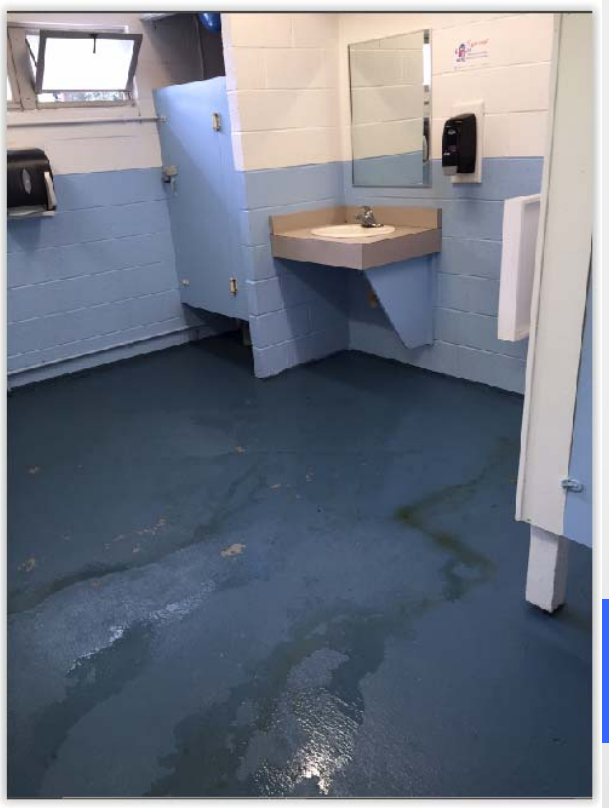
In 2015 SLV hired EnviroScience to study the community's storm water runoff into Silver Lake, the Cuyahoga River and Crystal Lake.

http://silverlakeestates.com/water%20quality.html

ROOF AND FASCIA . . . WERE REPLACED

Spring 2016 (via 2016 budget)





Thank You