



3088 Hottis Rd. Hale, MI 48739 Hale: 989.728.2200 Clare: 989.386.0600 Fax: 989.516.5900

August 1, 2013

Hess Lake Improvement Board
c/o Newaygo County Drain Commissioner - Mr. Dale Twing
306 S. North Street-PO Box 885
White Cloud, MI 49349



Mr. Twing,

Subject: Hess Lake Aeration Systems

Savin Lake Services is a fully integrated lakes management company offering mechanical control (harvesting), aquatic herbicide control, and biological control options for our customers. We also offer lake consulting services, lake aeration system design, and installation services. Savin Lake Services Inc. has been servicing northern Michigan's lakes and ponds for over (17) years. We currently provide services on (60) lakes & (150) ponds in northern Michigan. The lakes that we currently have under contract range in size from 10 acres to 2,500 acres.

Savin Lake Services is a licensed aquatic weed control specialist with offices located in Clare, and Hale, Michigan. We are members of the Tawas Area and West Branch Chambers of Commerce and the Better Business Bureau of Michigan. We are also members of the MLSA (Michigan Lakes & Streams Association), MAPMS (Midwest Aquatic Plant Management Society), MAMA (Michigan Aquatic Managers Association), and the AERF (Aquatic Ecosystem Restoration Foundation).

During our aquatic herbicide applications, we employ technology in our company that is not available with any other aquatic management company in the state of Michigan. Our GPS technology not only controls the application rate of the products that we apply to lakes, but our GPS technology also allows us to ensure that we are neither overlapping or missing areas on your lake. We can also provide you with an application report generated from our GPS system, so that you know exactly where we have applied product to a lake, for every application that we perform.

We have built our business based on servicing our customers well, and our multiple locations will allow us to respond to any issues or concerns that may arise on Hess Lake within a (2) day timeframe. Our solid reputation speaks for itself. We are known for a high level of quality service, and we have a strong commitment to customer satisfaction

Savin Lake Services is pleased to submit the following Vertex Commercial aeration system proposal for your consideration.

Preserving Our Lakes Today for Our Generations Tomorrow
www.LakeAndPond.com

[1]



3088 Hottis Rd. Hale, MI 48739 Hale: 989.728.2200 Clare: 989.386.0600 Fax: 989.516.5900

AERATION SYSTEMS:

Aeration systems offer great benefits to lake water quality. It is our belief that an aeration system in the canal & cove areas of Hess Lake will offer many long term water quality benefits. Simply put, an aeration system oxygenates the water column. This enhances bacterial growth to better the water quality for the long term. The oxygenated water column will promote the bacterial decomposition of the organics (leaves, twigs, etc.) at a rate of 10X that of bacterial decomposition without air (anaerobic decomposition). Aeration will balance the dissolved oxygen level in the lake, and will prevent future oxygen depletion. Aeration systems also aid in reducing stratification of the lake and prevent the formation of a thermocline, by constantly circulating the water column.

As you probably know, there are two conditions that are necessary for a healthy lake; (1) Sufficient oxygen and (2) adequate mixing of the water to reduce stratification so that the oxygen is uniformly distributed throughout the water column. Dissolved oxygen is not only used by fish, vegetation, and other organisms, but it is also essential in the oxidation and bacterial decomposition of suspended organic material and bottom sediments.

Under ideal conditions, natural forces can keep a lake healthy and aesthetically attractive, but unfortunately our lakes do not exist under ideal conditions. Water mixing and movement is restricted. In the summer months, hot, hazy and cloudy days worsen the situation because of lack of photosynthesis and the fact that warm water holds less oxygen. Rain and irrigation water runoff carries organic debris, nutrients and other chemicals that consume oxygen.

An effective aeration system brings oxygen into the water, eliminates stratification and increases circulation. This makes the water at all levels able to support animal and plant life, control algae growth by limiting its food source, and aid in the decomposition of suspended organic material and muck on the bottom of the lake.

For Hess Lake, we are recommending a variety of Vertex aeration systems. These systems will aerate the coves on Hess Lake very well. Our system designs are based on science and are designed by degreed aquatic biologists. Our systems have undergone independent laboratory testing to determine our GPM flow rates. Because we understand our flow rates, we can determine the necessary amount of aeration required for the Hess Lake aeration systems. Our design configuration is based on placement of the aeration cabinets at the specified design locations (see attached mapping). The calculated operational cost would be paid by the Hess Lake Improvement Board.





3088 Hottis Rd. Hale, MI 48739 Hale: 989.728.2200 Clare: 989.386.0600 Fax: 989.516.5900

For your convenience, we have selected three bays on Hess Lake for your pilot test. You may select the aeration solution that best suits your needs, or you can certainly select any two or all three bays based upon your testing criteria.

Hess Lake Cove 1 -

Please refer to the enclosed maps illustrating the engineered solution for this cove. We have limited the number of compressors for each solution to one location for each cove. This cove is the largest cove near the center of the lake on the south side. This solution is comprised of a Vertex HighFlow cabinet with four HighFlow compressors. It has been custom configured and valved to deliver air to the eight (8) XL5 AirStations. Each AirStation has five (5) MicronBubble diffuser disks.

(VERTEX AERATION SYSTEM –HF 8 XL5 SYSTEM – 0.65 turnovers per day)

Following is our recommendation for an aeration system for Hess Lake Cove 1. We have designed this system to aerate the cove utilizing eight (8) air diffuser assemblies. Each of the air diffuser assemblies has five (5) membrane diffusers. Therefore, our system design will provide 40 membrane diffusers. Our proposal utilizes one (1) LL 230V SH multi-compressor cabinet with Redundant Cooling Systems, eight (8) XL5 AirStations, Mounting Pad and Owner's Manual, and BottomLine Air Supply Tubing, Spooled (Self Sinking, Flexible PVC For Connecting AirStations to Compressor Cabinets). Pricing assumes that one (1) 30 amp 220V circuit are available at the specified design location.

Fix prices

- 1.) Aeration System as described above @.....\$ 14,850.00 total
- 2.) Sales Tax @.....\$ 891.00 total
- 3.) Shipping and Handling (R&L Carriers) @.....\$ 1,505.37 total
- 4.) Complete Assembly, Installation & 5 yr Maintenance @.....\$ 4,750.00 total

TOTAL AERATION SYSTEM PROPOSAL COVE 1@.....\$ 21,996.37 total

The Vertex HF 8 XL5 system uses four (4) high efficiency compressors running 230 volts drawing just 7.6 amps. Therefore, your electrical cost is approximately (\$191.30) per month. Savin Lakes Services recommends that aeration systems are run for approximately (7) months during the year. Therefore, your total electrical cost would be approximately (\$191.30) per month x (7) months totaling \$ 1,339.10 annually. Electrical costs are estimations based on an average electrical cost of \$ 0.15 per kilowatt hour.



3088 Hottis Rd. Hale, MI 48739 Hale: 989.728.2200 Clare: 989.386.0600 Fax: 989.516.5900

The compressed air is delivered through self-weighted air supply tubing called BottomLine Weighted Airline. Being self-weighted eliminates the need for bricks to weigh the tubing to the bottom. This tubing is also fishhook resistant and kink resistant. The compressors are easy to maintain, requiring occasional changing of the filter and a recommended piston maintenance kit to be performed every three (3) years. The compressors are housed in a QA4 Large Lake Cabinet with a sound reducing kit and includes three (3) 6" cooling fans for safety.

Hess Lake Cove 2 -

(VERTEX AERATION SYSTEM –HF 3 XL5 SYSTEM – 1.17 turnovers per day)

Following is our recommendation for an aeration system for Hess Lake Cove 2. We have designed this system to aerate the cove utilizing three (3) air diffuser assemblies. Each of the air diffuser assemblies has five (5) membrane diffusers. Therefore, our system design will provide 15 membrane diffusers. Our proposal utilizes one (1) QuietAir cabinet with two (2) ¾ Hp Brookwood Compressors, 290 CFM Fan, three (3) XL5 AirStations, Mounting Pad and Owner's Manual, and BottomLine Air Supply Tubing, Spooled (Self Sinking, Flexible PVC For Connecting AirStations to Compressor Cabinets). Pricing assumes that one (1) 30 amp 220V circuit are available at the specified design location.

Fix prices

- 1.) Aeration System as described above @.....\$ 5,313.60 total
- 2.) Sales Tax @.....\$ 318.82 total
- 3.) Shipping and Handling (R&L Carriers) @.....\$ 524.35 total
- 4.) Complete Assembly, Installation & 5 yr Maintenance @.....\$ 2,675.00 total

TOTAL AERATION SYSTEM PROPOSAL COVE 2@.....\$ 8,831.77 total

The Vertex HF 3 XL5 system uses two (2) high efficiency ¾ Hp Brookwood compressors running 230 volts drawing just 3.8 amps. Therefore, your electrical cost is approximately (\$95.65) per month. Savin Lakes Services recommends that aeration systems are run for approximately (7) months during the year. Therefore, your total electrical cost would be approximately (\$95.65) per month x (7) months totaling \$ 669.55 annually. Electrical costs are estimations based on an average electrical cost of \$ 0.15 per kilowatt hour. The compressors are in a QA 3 Large Cabinet with a sound reducing kit and two (2) 290 CFM cooling fans for safety.



3088 Hottis Rd. Hale, MI 48739 Hale: 989.728.2200 Clare: 989.386.0600 Fax: 989.516.5900

Hess Lake Cove 3 -

(VERTEX AERATION SYSTEM –HF 3 XL5 SYSTEM – 1.50 turnovers per day)

Following is our recommendation for an aeration system for Hess Lake Cove 3. It is nearly identical to Cove 2 except for some minor differences in the weighted airline distances. We have designed this system to aerate the cove utilizing three (3) air diffuser assemblies. Each of the air diffuser assemblies has five (5) membrane diffusers. Therefore, our system design will provide 15 membrane diffusers. Our proposal utilizes one (1) QuietAir cabinet with two (2) ¾ Hp Brookwood Compressors, 290 CFM Fan, three (3) XL5 AirStations, Mounting Pad and Owner's Manual, and BottomLine Air Supply Tubing, Spooled (Self Sinking, Flexible PVC For Connecting AirStations to Compressor Cabinets). Pricing assumes that one (1) 30 amp 220V circuit are available at the specified design location.

Fix prices

- 1.) Aeration System as described above @.....\$ 5,069.25 total
- 2.) Sales Tax @.....\$ 304.16 total
- 3.) Shipping and Handling (R&L Carriers) @.....\$ 486.45 total
- 4.) Complete Assembly, Installation & 5 yr Maintenance @.....\$ 2,675.00 total

TOTAL AERATION SYSTEM PROPOSAL @.....\$ **8,534.86 total**

The Vertex HF 3 XL5 system uses two (2) high efficiency ¾ Hp Brookwood compressors running 230 volts drawing just 3.8 amps. Therefore, your electrical cost is approximately (\$95.65) per month. Savin Lakes Services recommends that aeration systems are run for approximately (7) months during the year. Therefore, your total electrical cost would be approximately (\$95.65) per month x (7) months totaling \$ 669.55 annually. Electrical costs are estimations based on an average electrical cost of \$ 0.15 per kilowatt hour. The compressors are in a QA 3 Large Cabinet with a sound reducing kit and two (2) 290 CFM cooling fans for safety.

NOTE: Savin Lake Services pricing will remain firm until December 31, 2013.

DELIVERY: Savin Lake Services will complete Aeration System installation within (4) weeks of order placement.

AERATION SYSTEM PAYMENT TERMS: ½ with order, ½ upon completion.

AERATION SYSTEM WARRANTY: Our proposal includes annual inspection of the compressor cabinet, filter changes, and the necessary piston compressor maintenance kit. From the 5 year warranty and self-cleaning aspects of the XL5 AirStations, and the impressive GPM circulation rates, the Vertex aeration system is built for years of trouble-free service.



3088 Hottis Rd. Hale, MI 48739 Hale: 989.728.2200 Clare: 989.386.0600 Fax: 989.516.5900

Please note that there will be additional fees regarding the creation, application, and filing of the Michigan Department of Environmental Quality (DEQ) permit. This is a one-time fee and is a requirement of the state of Michigan.

- 1.) Michigan DEQ permit processing fee @\$ 1,750.00
- 2.) Michigan DEQ permit (estimated) @ \$ 500.00 to \$ 2,500.00

If this proposal meets your needs, please sign below indicating your acceptance. Please return this signed contract, along with the deposit at your earliest convenience. If you have any questions – please feel free to contact us at any time

Sincerely,

Guy Savin – President
Savin Lake Services

Hess Lake - Cove 1 - \$ 21,996.37 total

Mr. Dale Twing - Newaygo County Drain Commisioner

Date

Hess Lake - Cove 2 - \$ 8,831.77 total

Mr. Dale Twing - Newaygo County Drain Commisioner

Date

Hess Lake - Cove 3 - \$ 8,534.86 total

Mr. Dale Twing - Newaygo County Drain Commisioner

Date

Your Custom Vertex Aeration System Design Specifications

Lake Solutions Ver. 16.0 05/7/12

Customer Name:	Savin Lake Services
Contact Name:	John Sellinger
Site Name/Number:	Hess Lake Cove 1
Date:	August 1, 2013
Vertex Biologist:	Conrad Vanderlely

Surface Acres:	32.00
Perimeter Feet:	5,529
Slope Ratio Relative to 1	2.0
Average Center Depth:	6.0
Average Depth	5.9
Circulation Constraint Percentage	0.0
Total Acre Feet	187.4
Lake Volume (Gallons)	61,074,340
Monthly Influent Volume (Gallons)	0
Total Volume Requiring Aeration (Gallons)	61,074,340
GPM / XL5 AirStation	3,441
Gallons Pumped / Day	39,637,279
System Working Pressure (PSI)	12.9
Air Delivery Per AirStation at Depth(CFM)	2.6
Number of XL5 AirStations Specified:	8
Complete Turnovers / Day	0.65

Terminology

Surface Acres:	Total Surface Acres of Entire Water Body
Perimeter Feet:	Distance in Feet Along The Shoreline Around the Water Body
Bottom Slope Ratio :	Distance in Feet From Shoreline For Each Foot Increase in Depth
Average Center Depth:	Average of Depth Readings in Deepest Areas
Average Depth	Average Depth of Entire Lake in Feet
Circulation Constraint %	Reduced Circulation Due to Narrow Lake Areas, Islands, Etc.
Total Acre Feet:	An Acre Foot Equals One Acre One Foot Deep
Lake Volume :	Volume of The Entire Water Body Expressed in U.S. Gallons
Influent Volume:	Water Flowing into Lake that Requires Additional Aeration Capacity
GPM	Gallons of Water Pumped Per Minute
Gallons Pumped / Day:	Total Gallons of Water Pumped by All AirStations Per Day
PSI	Pounds Per Square Inch
CFM	Cubic Feet Per Minute
# of XL5 AirStations:	Recommended Number of XL5 AirStations For Proper Aeration
Turnovers / Day:	Number of Times Per Day the Entire Volume of The Water Body is Pumped From the Lake Bottom to The Lake's Surface



Vertex Water Features
 2100 NW 33rd Street, Pompano Beach, Florida 33069
 Tel:800-432-4302 / Fax:954-977-7877
www.vertexwaterfeatures.com
 Copyright Vertex Water Features 2012



Vertex Water Features

Lake Aeration Systems & Floating Fountains
Tel: (800)432-4302 / Fax (954)977-7877

Savin Lake Services Hess Lake Cove 1

LL 8XL5



Legend

- Compressor Cabinet
- XL5 AirStation
- BottomLine Tubing

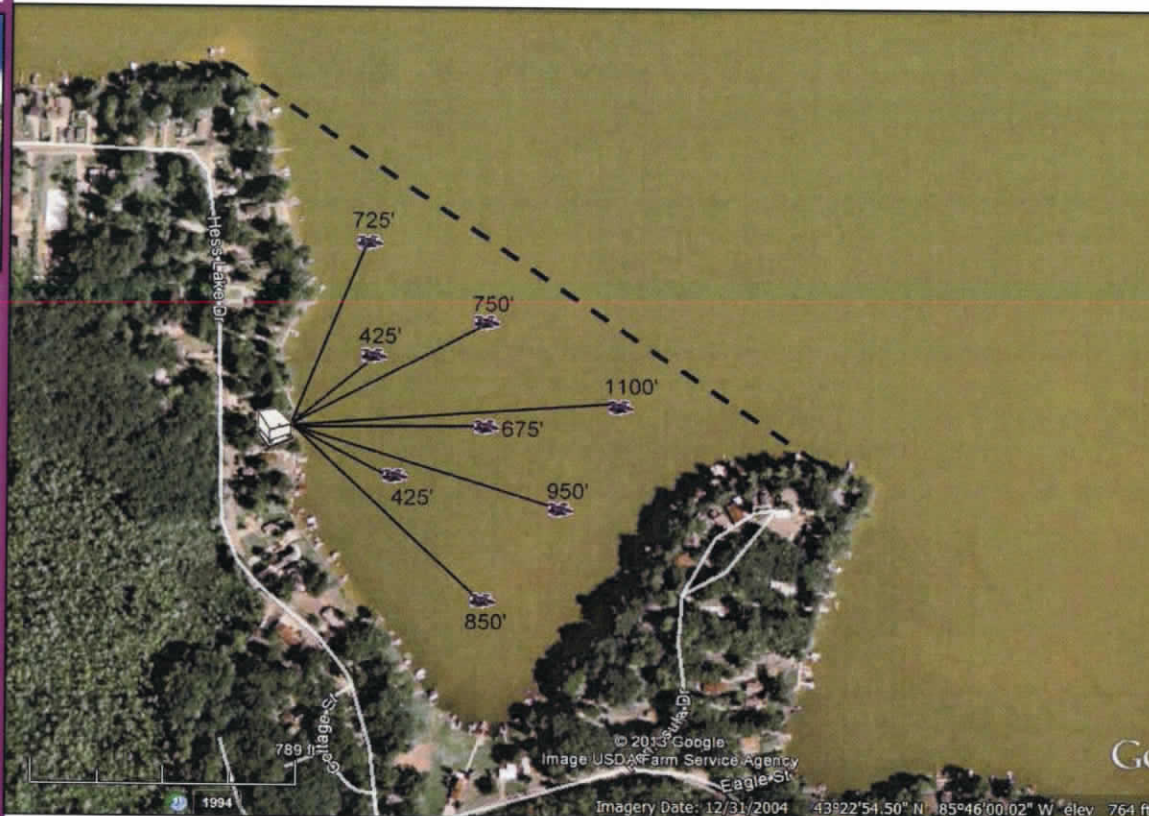
Optional Equipment

- Shoreline Valve Box
- 1" PVC Pipe

Site and System Specifications

Surface Acres:	32.0
Perimeter Feet:	5,529
Lake Volume, Gal.:	61,074,340
Total Acre Feet:	187
# of XL5 AirStations:	8
CFM / AirStation:	2.55
GPM / AirStation:	3,441
Daily Pumpage:	39,637,279
Turnovers/Day:	0.65
System PSI:	12.9

Date: 8/1/13





Vertex Water Features

Lake Aeration Systems & Floating Fountains



BOTTOM AERATION



HF8 XL5™

The Vertex HF8 XL5™ aeration system, designed for larger lakes and reservoirs, utilizes Vertex's latest technology to provide the most aeration for your money. Four super-duty, Brookwood™ twin cylinder HighFlow™ compressors, housed in our rustproof aluminum outdoor cabinet, providing over 22 CFM of air, feeds eight of our bottom mounted XL5 AirStations™. The rising force of millions of bubbles circulates the entire water column, entraining bottom water up to the surface allowing vital oxygen to be absorbed and poisonous gases expelled. With no electricity in the water, Vertex's aeration systems are safe for most any type of water recreation.

Our systems have a full 2-year warranty plus a Limited Lifetime warranty against rust and corrosion on the cabinet, 5-year warranty on the AirStations™ and a 15-year warranty on BottomLine™ supply tubing.

FEATURES

AIRSTATIONXL5™

- Total pumping capacity of up to 81,000 GPM
- Huge 5.4 ft² active lifting surface
- Eight XL5 AirStations™ with five self-cleaning membrane disks each
- StableTrak™ technology stabilizes air column increasing lift velocity
- FlowControl™ technology equalizes airflow to each disc
- 5-year "No Questions" warranty

BROOKWOOD™ COMPRESSOR

- Four 3/4hp (1.12kW) Vertex HighFlow™ Components
- 22.4 Total CFM, 25 Max PSI, 230V
- Highest flow rate of any compressor in its class
- Thermal overload protection
- 2 to 4 year extended duty cycle between scheduled maintenance
- Full 2-year Vertex warranty

QUIETAIR™ ETL SAFETY CERTIFIED CABINET

- Includes SafeStart™ technology allowing full pressure restarts
- Powder coated aluminum for a durable attractive finish
- Redundant cooling system with (3) high capacity 290 CFM cooling fans
- Easy access design with keyed lock
- Exterior disconnect for safe operation
- Heavy duty, light weight mounting pad included
- Limited lifetime warranty against rust
- Integrated cabinet muffler for quieter operation

BOTTOMLINE™ TUBING

- Over-sized I.D. for high flow
- Self-weighted for easy installation
- Available in 100' and 500' increments
- 15-year Vertex warranty

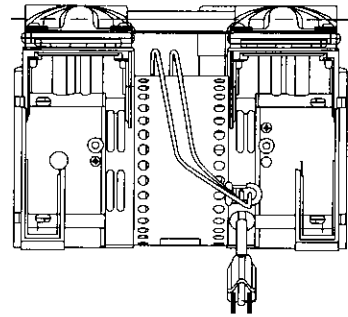
BENEFITS TO THE LAKE

- High pumping rate easily penetrates stratification layers
- Circulates entire water column
- Increases oxygen levels throughout water column
- Promotes beneficial bacteria growth
- Prevents low oxygen fish kills
- Reduces nutrient levels and associated algae growth
- Oxidizes/reduces bottom muck
- Expands oxygenated habitat for improved fisheries
- Reduces aquatic midge and mosquito insect hatches
- Eliminates foul odors from undesirable dissolved gases
- Safe entry – no electricity in the water
- Extremely energy efficient

SPECIFICATIONS: HF8 XL5™ LAKE AERATION SYSTEM

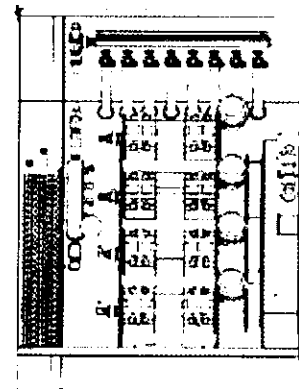
BROOKWOOD™ HIGHFLOW™ COMPRESSOR

Four 3/4hp (1.12kW), 230v, 22.4 total CFM. 25 PSI, single phase, thermally protected twin cylinder piston type compressors. 50 & 60 Hz. UR, CE, CSA listed and built for continuous 24/7 operation. Super-duty Brookwood™ HighFlow™ compressors incorporate upgraded rotors, stators, bearings and capacitors and are thermally protected, oil-free, and require no lubrication; just periodic replacement of air filter. Extended duty cycle is approximately 2 to 4 years for compressor service, about 2 to 4 times the duty cycle of ordinary piston and rotary vane compressors. All Brookwood™ HighFlow™ compressor systems carry a 2-year warranty.



QUIETAIR™ CABINET

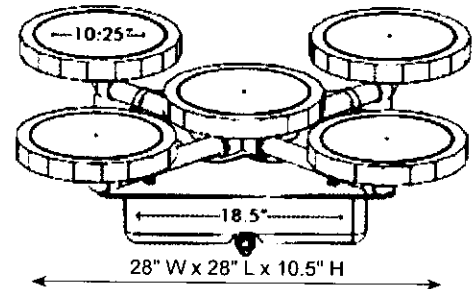
Enclosure comes equipped with keyed lock for security and exterior disconnect switch for safety. Fully gasketed and constructed of aluminum with gray electrostatically-bonded powder coating to provide lifetime warranty against rust. Enclosure furnished with stamped ventilation grill to insure forced air circulation and integral redundant cooling fans, producing 870 CFM to guard against excessive compressor operating temperatures. This system is equipped with Vertex SafeStart™ technology allowing auto restart under maximum rated pressure without motor damage. Cabinet provided with HDPE mounting pad. 230V system requires the purchaser to provide GFCI protection on their electrical supply circuit. ETL Listed.



28" W x 32" L x 22.5" H

AIRSTATION XL5™ ASSEMBLY

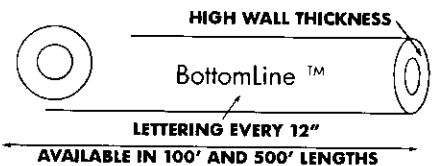
Diffuser station consists of five self-cleaning, 9" diameter, flexible membrane diffusers of EPDM compound with 100% rebound memory, each producing millions of fine 500 to 3000 micron bubbles. Includes FlowControl™ technology that equalizes airflow to all diffusers on uneven bottoms and StableTrak™ technology which stabilizes the bubble column increasing lift velocity. Each diffuser station is equipped with a vacuum-formed HDPE base, sonic spot-welded to provide unit integrity. Base unit has a hollow chamber design for the addition of inert pea gravel ballast and a lipped design to prevent settling into soft bottom sediments.



28" W x 28" L x 10.5" H

BOTTOMLINE™ SUPPLY TUBING

Self-weighted, direct burial submersible tubing for connection from compressor to diffuser stations. Tubing is flexible PVC composite construction for use with standard PVC solvent weld cement and insert fittings. Tubing has 0.58" I.D. and high wall thickness for long term durability and protection against punctures. Remains flexible in cold temperatures.



AVAILABLE IN 100' AND 500' LENGTHS



Vertex Water Features
Lake Aeration Systems & Floating Fountains

(800) 432-4302 / Fax (954) 977-7877

www.vertexwaterfeatures.com/e-mail: info@vertexwaterfeatures.com

Install all electrical equipment in accordance with Article 682 of the National Electrical Code and all local codes. Vertex Water Features reserves the right to improve and change our designs and/or specifications of our aerators without notice or obligation.
©2012 Vertex Water Features

Your Custom Vertex Aeration System Design Specifications

Lake Solutions Ver. 16.0 05/7/12

Customer Name:	Savin Lake Services
Contact Name:	John Sellinger
Site Name/Number:	Hess Lake Cove 2
Date:	August 1, 2013
Vertex Biologist:	Conrad Vanderlely

Surface Acres:	8.65
Perimeter Feet:	2,919
Slope Ratio Relative to 1	2.0
Average Center Depth:	6.0
Average Depth	5.7
Circulation Constraint Percentage	0.0
Total Acre Feet	49.5
Lake Volume (Gallons)	16,125,531
Monthly Influent Volume (Gallons)	0
Total Volume Requiring Aeration (Gallons)	16,125,531
GPM / XL5 AirStation	4,368
Gallons Pumped / Day	18,871,917
System Working Pressure (PSI)	9.3
Air Delivery Per AirStation at Depth(CFM)	3.5
Number of XL5 AirStations Specified:	3
Complete Turnovers / Day	1.17

Terminology

Surface Acres:	Total Surface Acres of Entire Water Body
Perimeter Feet:	Distance in Feet Along The Shoreline Around the Water Body
Bottom Slope Ratio :	Distance in Feet From Shoreline For Each Foot Increase in Depth
Average Center Depth:	Average of Depth Readings in Deepest Areas
Average Depth	Average Depth of Entire Lake in Feet
Circulation Constraint %	Reduced Circulation Due to Narrow Lake Areas, Islands, Etc.
Total Acre Feet:	An Acre Foot Equals One Acre One Foot Deep
Lake Volume :	Volume of The Entire Water Body Expressed in U.S. Gallons
Influent Volume:	Water Flowing into Lake that Requires Additional Aeration Capacity
GPM	Gallons of Water Pumped Per Minute
Gallons Pumped / Day:	Total Gallons of Water Pumped by All AirStations Per Day
PSI	Pounds Per Square Inch
CFM	Cubic Feet Per Minute
# of XL5 AirStations:	Recommended Number of XL5 AirStations For Proper Aeration
Turnovers / Day:	Number of Times Per Day the Entire Volume of The Water Body is Pumped From the Lake Bottom to The Lake's Surface



Vertex Water Features
2100 NW 33rd Street, Pompano Beach, Florida 33069
Tel:800-432-4302 / Fax:954-977-7877
www.vertexwaterfeatures.com
Copyright Vertex Water Features 2012



Vertex Water Features

Lake Aeration Systems & Floating Fountains
Tel: (800)432-4302 / Fax (954)977-7877

Savin Lake Services

Hess Lake Cove 2

HF 3XL5



Legend

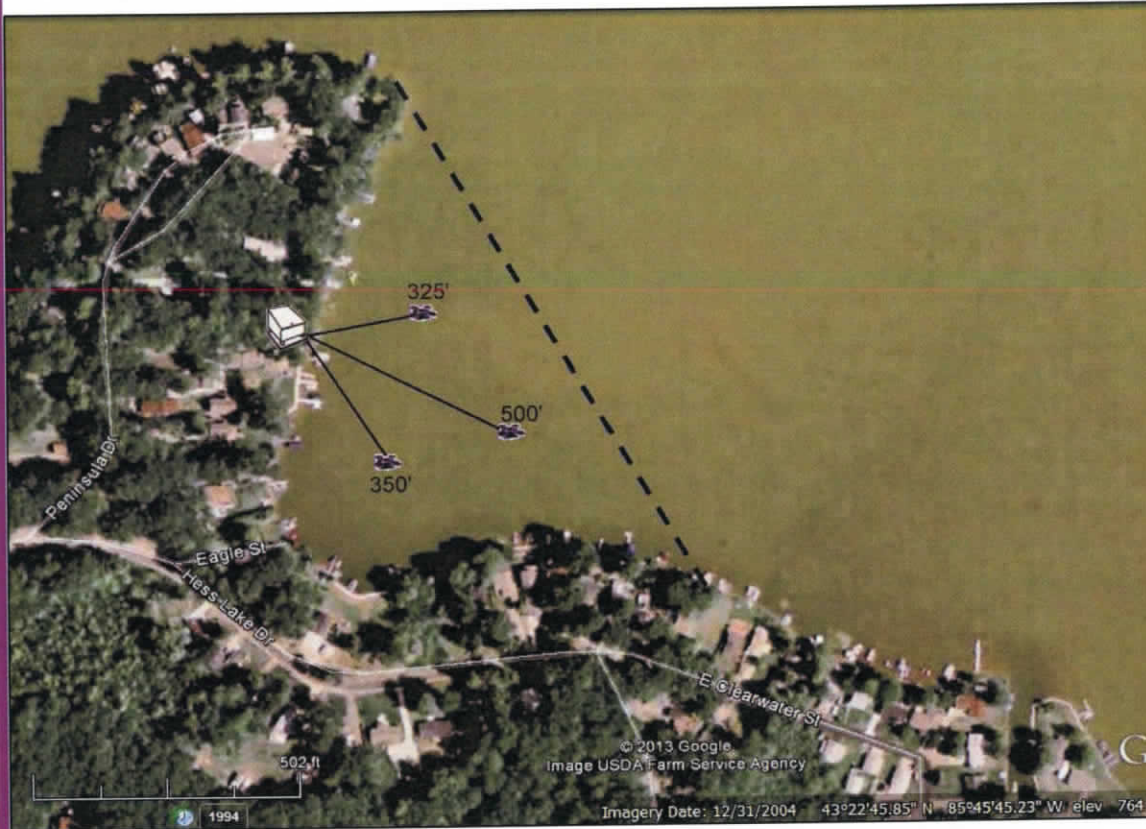
- Compressor Cabinet
- XL5 AirStation
- BottomLine Tubing

Optional Equipment

- Shoreline Valve Box
- 1" PVC Pipe

Site and System Specifications

Surface Acres:	8.7
Perimeter Feet:	2,919
Lake Volume, Gal.:	16,125,531
Total Acre Feet:	49
# of XL5 AirStations:	3
CFM / AirStation:	3.46
GPM / AirStation:	4,368
Daily Pumpage:	18,871,917
Turnovers/Day:	1.17
System PSI:	9.3
Date:	8/1/13



1

Your Custom Vertex Aeration System Design Specifications

Lake Solutions Ver. 16.0 05/7/12

Customer Name:	Savin Lake Services
Contact Name:	John Sellinger
Site Name/Number:	Hess Lake Cove 3
Date:	August 1, 2013
Vertex Biologist:	Conrad Vanderlely

Surface Acres:	6.80
Perimeter Feet:	2,553
Slope Ratio Relative to 1	2.0
Average Center Depth:	6.0
Average Depth	5.7
Circulation Constraint Percentage	0.0
Total Acre Feet	38.7
Lake Volume (Gallons)	12,607,155
Monthly Influent Volume (Gallons)	0
Total Volume Requiring Aeration (Gallons)	12,607,155
GPM / XL5 AirStation	4,368
Gallons Pumped / Day	18,871,917
System Working Pressure (PSI)	9.0
Air Delivery Per AirStation at Depth(CFM)	3.5
Number of XL5 AirStations Specified:	3
Complete Turnovers / Day	1.50

Terminology

Surface Acres:	Total Surface Acres of Entire Water Body
Perimeter Feet:	Distance in Feet Along The Shoreline Around the Water Body
Bottom Slope Ratio :	Distance in Feet From Shoreline For Each Foot Increase in Depth
Average Center Depth:	Average of Depth Readings in Deepest Areas
Average Depth	Average Depth of Entire Lake in Feet
Circulation Constraint %	Reduced Circulation Due to Narrow Lake Areas, Islands, Etc.
Total Acre Feet:	An Acre Foot Equals One Acre One Foot Deep
Lake Volume :	Volume of The Entire Water Body Expressed in U.S. Gallons
Influent Volume:	Water Flowing into Lake that Requires Additional Aeration Capacity
GPM	Gallons of Water Pumped Per Minute
Gallons Pumped / Day:	Total Gallons of Water Pumped by All AirStations Per Day
PSI	Pounds Per Square Inch
CFM	Cubic Feet Per Minute
# of XL5 AirStations:	Recommended Number of XL5 AirStations For Proper Aeration
Turnovers / Day:	Number of Times Per Day the Entire Volume of The Water Body is Pumped From the Lake Bottom to The Lake's Surface



Vertex Water Features

2100 NW 33rd Street, Pompano Beach, Florida 33069
 Tel:800-432-4302 / Fax:954-977-7877
www.vertexwaterfeatures.com
 Copyright Vertex Water Features 2012



Vertex Water Features



Lake Aeration Systems & Floating Fountains
Tel: (800)432-4302 / Fax (954)977-7877

Savin Lake Services Hess Lake Cove 3



HF 3XL5



Legend

-  Compressor Cabinet
-  XL5 AirStation
-  BottomLine Tubing

Optional Equipment

-  Shoreline Valve Box
-  1" PVC Pipe

Site and System Specifications

Surface Acres:	6.8
Perimeter Feet:	2,553
Lake Volume, Gal.:	12,607,155
Total Acre Feet:	39
# of XL5 AirStations:	3
CFM / AirStation:	3.46
GPM / AirStation:	4,368
Daily Pumpage:	18,871,917
Turnovers/Day:	1.50
System PSI:	9.0
Date:	8/1/13

18



Vertex Water Features Pond and Lake Aeration

BOTTOM AERATION



HF3 XL5™

The Vertex HF3 XL5™ aerator has Vertex's latest technology to provide the most aeration for your money. Designed for larger ponds and lakes, a HF3 XL5™ can aerate approximately 5.0-9.0 acres depending on shape, slope, depth, oxygen demand and other factors. Two super-duty Brookwood™ twin cylinder HighFlow™ compressors, housed in our rustproof aluminum outdoor cabinet, feed three bottom mounted XL5 AirStations™ utilizing five MicronBubble™ diffusers each. The rising force of millions of bubbles circulates the entire water column, entraining bottom water up to the surface allowing vital oxygen to be absorbed and poisonous gases expelled. With no electricity in the water, Vertex's aeration systems are safe for most any type of water recreation.

Our systems have a full 2-year warranty plus a Limited Lifetime warranty against rust and corrosion on the cabinet, 5-year warranty on the AirStations™ and a 15-year warranty on BottomLine™ supply tubing.



FEATURES

AIRSTATIONXL5™

- Total pumping capacity of up to 35,400 GPM
- Huge 5.4 ft² active lifting surface
- Three XL5 AirStation™ with five self-cleaning membrane disks each
- StableTrak™ technology stabilizes air column increasing lift velocity
- FlowControl™ technology equalizes airflow to each disc
- 5-year "No Questions" warranty

BROOKWOOD™ COMPRESSOR

- Two 3/4hp (1.12kW) Vertex HighFlow™ Series
- 11.2 Total CFM, 25 Max PSI, 115v or 230v
- Highest flow rate in its class
- Thermal overload protection
- 2 to 4 year extended duty cycle between scheduled maintenance
- Full 2-year Vertex warranty

QUIETAIR™ CABINET

- Includes SafeStart™ technology allowing full pressure restarts
- Powder coated aluminum for a durable attractive finish
- Redundant cooling system with (2) high capacity 290 CFM cooling fans
- Easy access design with cam lock
- Easy plug-in connection to waterside electrical service
- Disconnect switch
- Heavy duty, light weight mounting pad
- Sound dampening kit optional
- Limited lifetime warranty against rust

BOTTOMLINE™ TUBING

- Over-sized I.D. for high flow
- Self-weighted for easy installation
- Available in 100' and 500' increments
- 15-year Vertex warranty

BENEFITS TO THE LAKE

- High pumping rate easily penetrates stratification layers
- Circulates entire water column
- Increases oxygen levels throughout water column
- Promotes beneficial bacteria growth
- Prevents low oxygen fish kills
- Reduces nutrient levels and associated algae growth
- Oxidizes/reduces bottom muck
- Expands oxygenated habitat for improved fisheries
- Reduces aquatic midge and mosquito insect hatches
- Eliminates foul odors from undesirable dissolved gases
- Safe entry – no electricity in the water
- Extremely energy efficient