



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
PERMIT**

ISSUED TO:

Hess lake Improvement Board
P O Box 885
White Cloud, MI 49349

Permit No.	14-62-0005-P
Issued	May 23, 2014
Extended	
Revised	
Expires	May 23, 2019

This permit is being issued by the Michigan Department of Environmental Quality (MDEQ) under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), and specifically:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Part 301, Inland Lakes and Streams | <input type="checkbox"/> Part 315, Dam Safety |
| <input type="checkbox"/> Part 325, Great Lakes Submerged Lands | <input type="checkbox"/> Part 323, Shorelands Protection and Management |
| <input type="checkbox"/> Part 303, Wetlands Protection | <input type="checkbox"/> Part 353, Sand Dunes Protection and Management |
| <input type="checkbox"/> Part 31, Floodplain/Water Resources Protection | |

Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:

Permitted Activity:

Install a total of 14 (fourteen) flexible membrane diffusers on bottomlands of Hess Lake in the locations shown on the attached plans. Diffusers shall be connected to three air compressor units located in adjacent uplands via approximately 9,000 feet of self-sinking PVC composite airline. All work shall be conducted in accordance with the attached plans and conditions of this permit.

Water Course Affected: Hess Lake

Property Location: Newaygo County, Grant Township, Section 11 12
Subdivision, Lot Town/Range 11N, 12W Property Tax No.

Authority granted by this permit is subject to the following limitations:

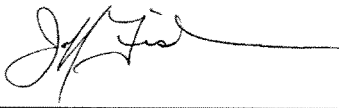
- A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
- B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31, Water Resources Protection, of the NREPA.
- C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
- D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
- E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
- F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with Act 53 of the Public Act of 1974 and comply with each of the requirements of that Act.
- G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
- H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
- I. Permittee shall notify the MDEQ within one week after the completion of the activity authorized by this permit, by completing and forwarding the attached preaddressed postcard to the office addressed thereon.
- J. This permit shall not be assigned or transferred without the written approval of the MDEQ.

- K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
- L. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31, and wetland).
- M. In issuing this permit, the MDEQ has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, the MDEQ may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
- N. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify the State of Michigan applies only if the State (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the State and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.
- O. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, the MDEQ may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
- P. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from the MDEQ. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by the MDEQ prior to being implemented.
- Q. This permit may be transferred to another person upon written approval of the MDEQ. The permittee must submit a written request to the MDEQ to transfer the permit to the new owner. The new owner must also submit a written request to the MDEQ to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties which includes all the above information may be provided to the MDEQ. The MDEQ will review the request and if approved, will provide written notification to the new owner.
- R. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.
- S. Construction must be undertaken and completed during the dry period of the wetland. If the area does not dry out, construction shall be done on equipment mats to prevent compaction of the soil.
- T. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent.
- U. Authority granted by this permit does not waive permit requirements under the authority of Part 305, Natural Rivers, of the NREPA. A Natural Rivers Zoning Permit may be required for construction, land alteration, streambank stabilization, or vegetation removal along or near a natural river.
- V. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.
- W. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the waterbody are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.
- X. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the MDNR, Fisheries Division.
- Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:
- 1. The permitted diffused aeration system shall not be operated from December 1 to March 31 of any given year.**
 2. If operation of any/all of the diffusers is permanently discontinued, the diffuser(s) and connecting airline(s) shall be removed from the bottomland of Hess Lake.
 3. To protect fish during critical spawning and early life history stages, **the aeration system should not be installed during March 1-June 30.**
 4. Dredging is not authorized by this permit.
 5. Prior to initiating construction, authorized by this permit, the permittee is required to provide a copy of the permit to the contractor(s) for review.
 6. The property owner, contractor(s), and any agent involved in exercising this permit are held responsible to ensure the project is constructed in accordance with all drawings and specifications

contained in this permit. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by this permit.

7. Notification shall be made to the MDEQ's Water Resources Division, five days prior to initial operation of the aeration system. Please notify Jeff Fischer at fischerj1@michigan.gov or 616-356-0030.
8. **As a primary condition of this permit, sampling of the parameters listed below shall be taken from a minimum of 2 locations prior to operation of the aeration system during May 15-June 10, 2014, July 1-15, 2014, and September 1-15, 2014. Samples shall be taken from the same locations during operation of the aeration system during May 15 – June 10, 2015, July 1-15, 2015, and September 1-15, 2015.**
 - a. Data collection points shall be recorded via GPS, or other similar technology so subsequent data can be collected as closely as possible to previous sampling locations. Marking buoys are not recommended, as they may become a navigation hazard for watercraft users, will require MDEQ permit, and they may be stolen or otherwise become relocated.
 - b. Weather conditions shall also be reported on collection dates and shall include at a minimum: date and time of data collection, general wind direction and speed, relative cloudiness, air temperature, wave height, etc. The individual(s) collecting the data shall sign and date all of the data collection sheet(s).
 - c. **The following parameters shall be measured according to the above specifications:**
 - i. Profiles of water temp vs depth; Dissolved oxygen vs depth; conductivity vs depth, and pH versus depth shall be developed for each location
 - ii. Secchi disk transparency
 - iii. Water column total phosphorus, orthophosphorus, and total suspended solids (surface, mid-depth, and bottom).
 - iv. Chlorophyll a concentrations(from surface as depth integrated sample)
 - v. Algal phytoplankton community composition (as determined through microscopy) including the relative proportion of percent blue green algae, green algae, and siliceous diatoms.
 - d. A report compiling and summarizing all data collected shall be submitted to the MDEQ, **in the approved MDEQ Report Format, by no later than December 31, 2015.** The report submitted in 2015 shall include the data from both years of testing, making note of any significant changes or trends.
9. Upon review of the final report submitted in 2015, the MDEQ will make a determination regarding the impact of the operation of the diffused aeration system. **If the MDEQ finds that the system is causing an adverse impact on any of the above tested parameters or violates any applicable statute, the permittee agrees to cease operation and remove the system from bottomlands of Hess Lake.** If no adverse impact is found to be caused by the system, it may continue to be operated in accordance with the conditions of this permit.
10. In order to ensure the validity of the data collected, **the permittee (Hess Lake Improvement board), and their contractor(s) or agent(s) shall not conduct any chemical herbicide treatments within the area(s) of proposed or active aeration on Hess Lake during 2014 and 2015.** The aforementioned should also discourage any chemical herbicide treatment by individual riparian property owners.
11. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA). To locate the Soil Erosion Program Administrator for your county visit www.deq.state.mi.us/sesca/.

12. This project shall be installed as shown on the attached plans. The authorization for this project was based upon the receipt of written authorization(s) from the affected riparian owner(s). These written authorizations must be updated if the property ownership changes or the landowner revokes the authorization during the term of this permit.
13. The structures shall be firmly anchored to prevent flotation or lateral movement.

By: 

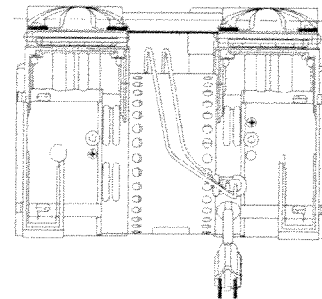
Jeff Fischer
Water Resources Division
616-356-0500

cc: Grant Township Clerk
Newaygo County Drain Commissioner
Newaygo CEA
Savin Lake Services, LLC
MDNR Fisheries Division

SPECIFICATIONS: HF3 XL5™ LAKE AERATION SYSTEM

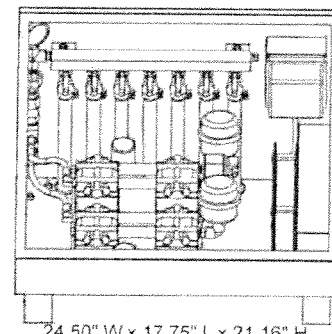
BROOKWOOD™ HIGHFLOW™ COMPRESSOR

Two 3/4hp (1.12kW), 115v or 230v, 11.2 Total CFM, 25 PSI, single phase, twin cylinder piston type compressors. 230 volt single phase 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

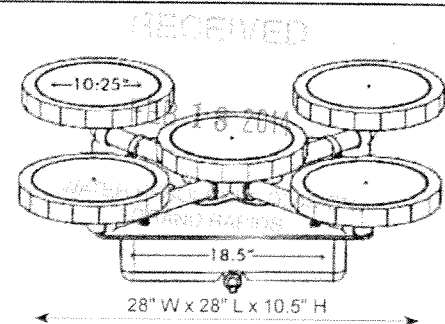
Enclosure comes equipped with cam lock for security, fully gasketed and constructed of aluminum with gray electrostatically-bonded powder coating to provide Limited Lifetime warranty against cabinet rust and corrosion. Enclosure furnished with stamped ventilation grill to insure forced air circulation and an integral cooling fan with thermal protection, producing 290 CFM to guard against excessive compressor operating temperatures. Equipped with Vertex SafeStart™ technology allowing auto restart under maximum rated pressure without motor damage. Cabinet provided with HDPE mounting pad. Enclosure comes equipped with class A GFCI circuit protection for all electrical components. 230 volt systems require the purchaser to provide GFCI protection on their electrical supply circuit. Quick disconnect switch included. Side mounted muffler box and additional insulation optional for quieter operation.



24.50" W x 17.75" L x 21.16" H

AIRSTATION XL5™ ASSEMBLY

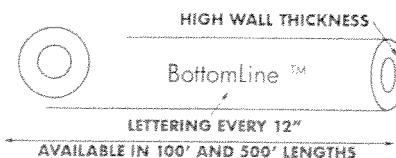
Diffuser station consists of five self-cleaning, 9" diameter, flexible membrane diffusers of EPDM compound with 100% rebound memory, each producing millions of fine 500 to 3000 micron bubbles. Includes FlowControl™ technology that equalizes airflow to all diffusers on uneven bottoms and StableTrak™ technology 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



(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.

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MDEQ Approved Plans
Project # 14-62-0005
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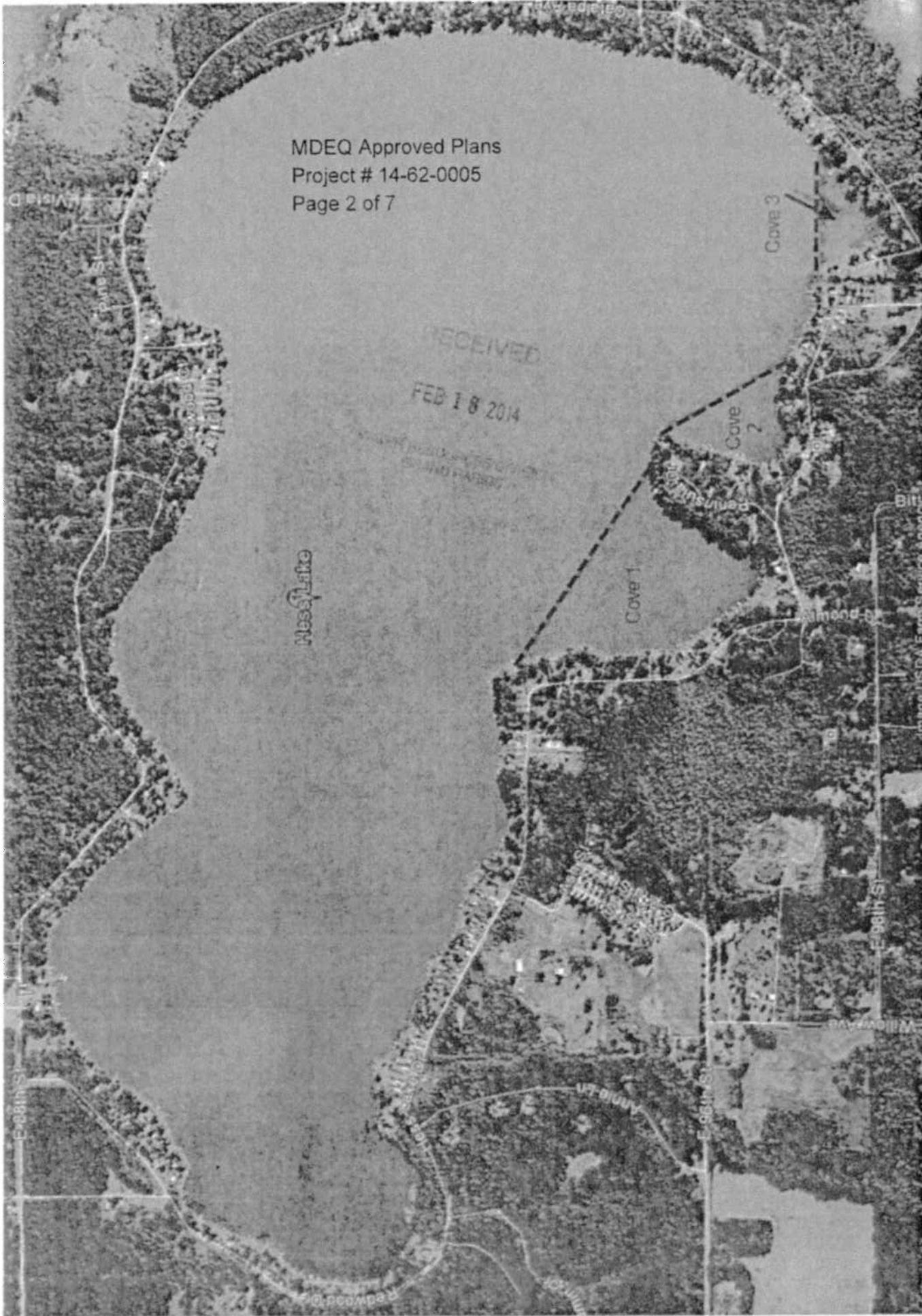
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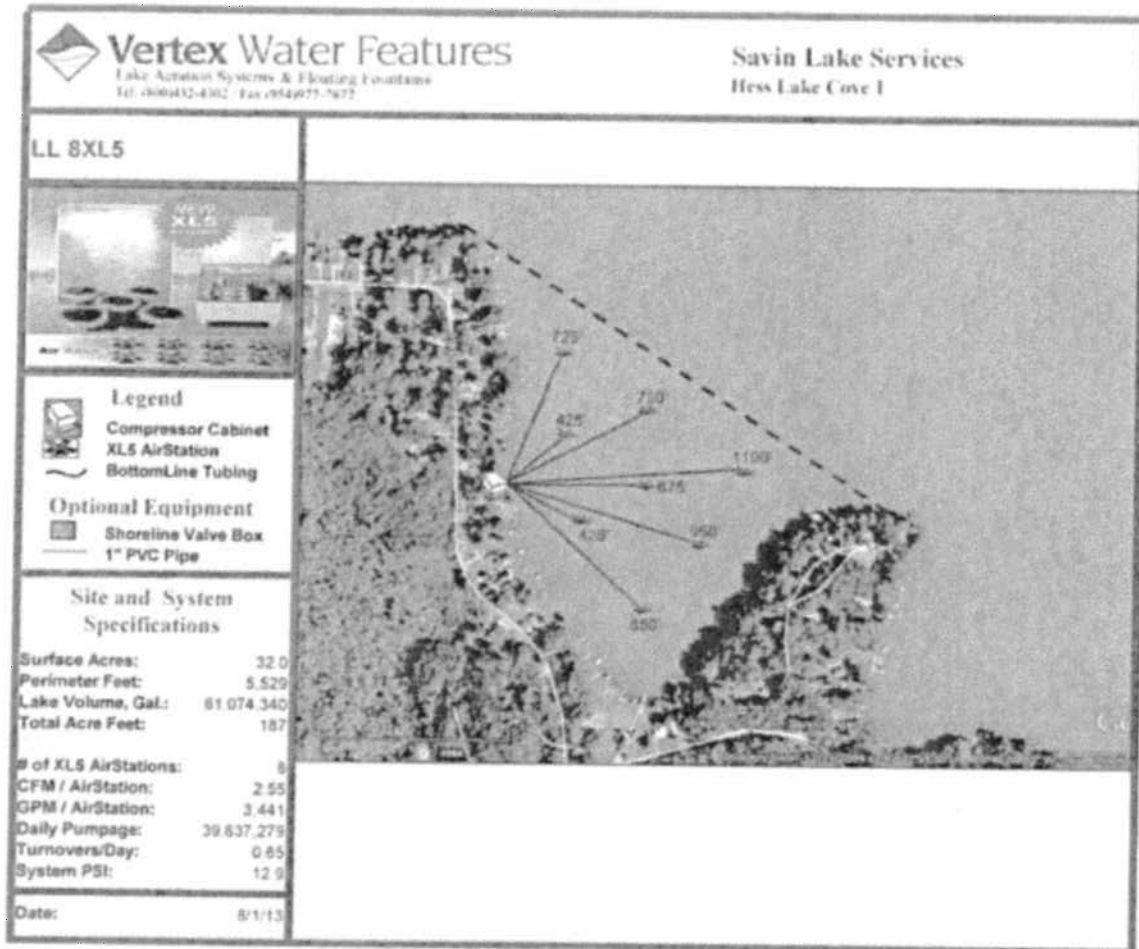
Hess Lake

Cove 3

Cove 2

Cove 1


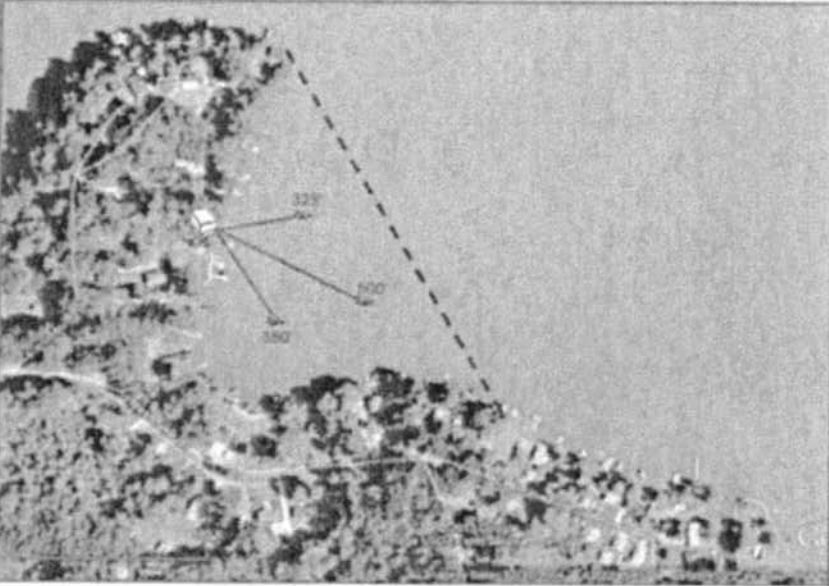










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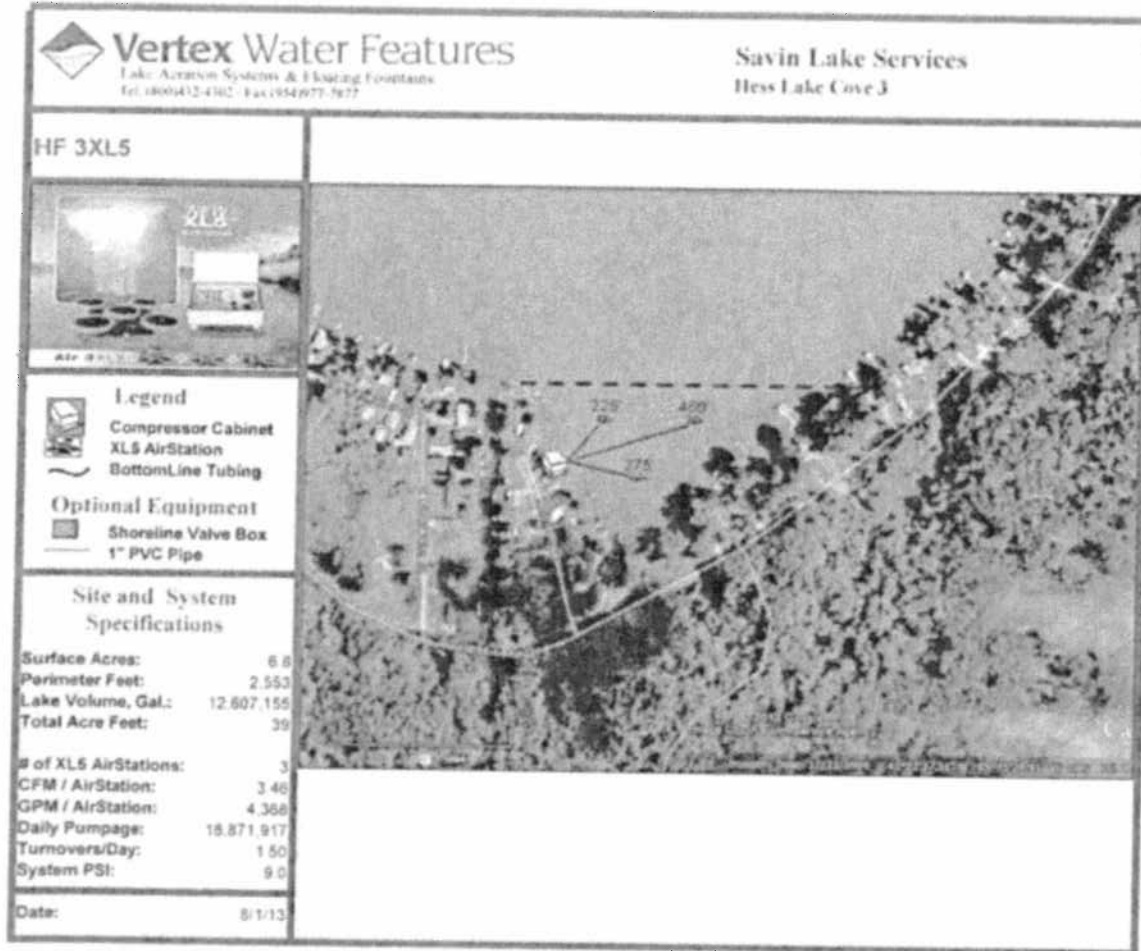
FEB 18 2014

APPROVED

 Vertex Water Features Lake Aeration Systems & Floating Fountains Tel: 480.643.4402 Fax: 480.677.7877		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:	3,480		
GPM / AirStation:	4,368		
Daily Pumpage:	18,871,917		
Turnovers/Day:	1.17		
System PSI:	9.3		
Date:	8/1/13		

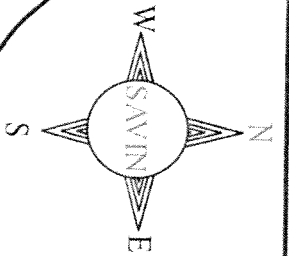
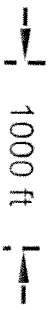
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Lake Area 755 acres
Shoreline Length 29,454 ft.

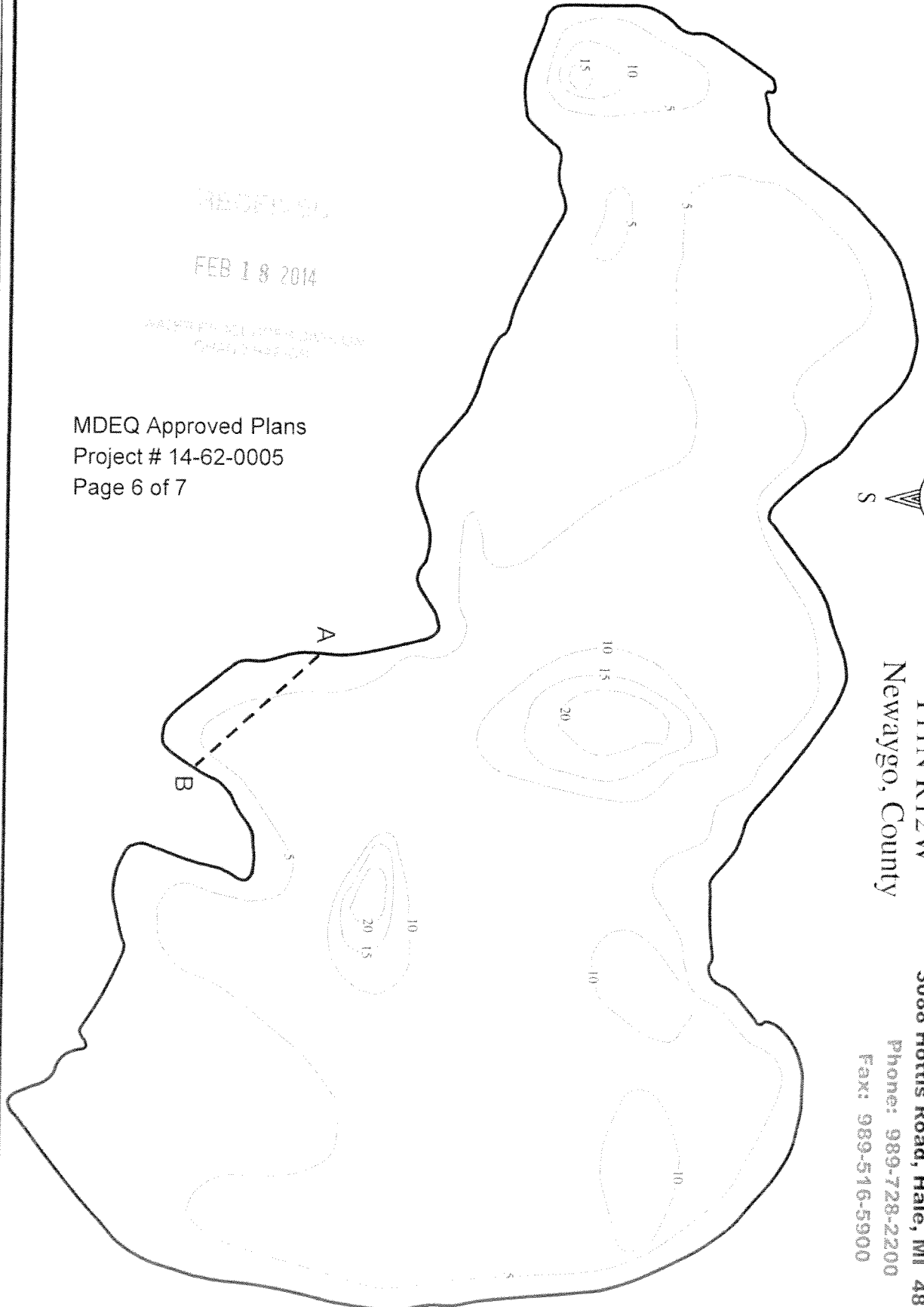


Hess Lake
Section 4, 5, 31, 32 & 33
Brooks & Grant
T11N R12W
Newaygo, County

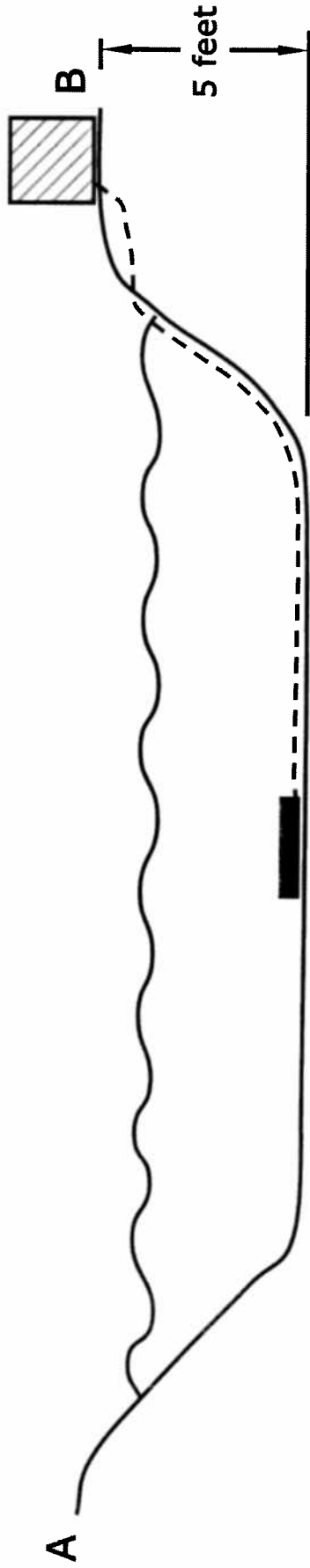
SAVIN
WILAKE SERVICES
3088 Hottis Road, Hale, MI 48739
Phone: 989-728-2200
Fax: 989-516-5900

TRACED FROM
FEB 18 2014
AASHTO PLANTING DATA AND
CHART DATA



MDEQ Approved Plans
Project # 14-62-0005
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Cross Section of Aeration System for Hess Lake Typical Section



Key

-  Compressor Box
-  Diffusers
-  Water Surface
-  Bottom Lands (Ground)
-  Weighted Airline