Hello Hess Lake Residents,

Please see attached EGLE Permit to do an Alum Treatment on Hess Lake. The Alum Description and costs, about $750,000, is stated in the 2020 Progressive AE Hess Lake Study, pages, 25, 31, 32, 33. However, this could change since the Hess Lake Improvement Board has not decided yet to move forward with this project. Please see 2020 Hess Lake Progressive AE Study under the Engineering Tab of this website.

www.hesslake.org

Take Care & Stay Safe,

Bob Ripstra, Hess Lake Summer Resident

Troy Landline, 248-680-9763

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
-DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING

LIESL EICHLER CLARK
DIRECTOR

June 9, 2022

VIA E-MAIL

Newaygo County Drain Commissioner
Hess Lake Improvement Board
306 South North Street
PO Box 885
White Cloud, MI 49349-0885

Dear Newaygo County Drain Commissioner:

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) approves your April 1, 2022, request to use Alum in Hess Lake per R 323.1097 (Rule 97) of the Part 4 Rules, Water Quality Standards, promulgated pursuant to Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The approved plan involves the application of Alum to 740 acres of Hess Lake to control the amount of phosphorus and reduce the growth of algae. Hess Lake is located in Newaygo County, Michigan (43°23'12.5"N 85°46'06.6"W).

The enclosed Certification of Approval is issued pursuant to Rule 97 of Michigan's Water Quality Standards and provides specific reporting and procedural requirements that must be complied with for EGLE authorization. Please carefully review the conditions of the Certification of Approval prior to commencing the project.

If you have any questions, please contact me at 517-242-4989 or NedrichS@Michigan.gov.

Sincerely,

Sara Nedrich

Sara Nedrich, Toxicologist
Water Toxics Unit
Surface Water Assessment Section
Water Resources Division

Enclosures
cc: Audrey Kirk, Grand Rapids District Supervisor, EGLE
Rule 97 File, EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
CERTIFICATION OF APPROVAL

The Hess Lake Improvement Board, its contractors, or authorized representatives, are hereby granted approval to apply Alum to Hess Lake located in Newaygo County (43°23'12.5"N 85°46'06.6"W) for phosphorus control, in compliance with R 323.1097 (Rule 97) of the Part 4 Rules, Water Quality Standards, promulgated pursuant to Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This approval is based on the revised rule 97 application information provided in an April 1, 2022, e-mail from Tony Groves to Sara Nedrich, Toxicologist, Water Toxics Unit, Surface Water Assessment Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy (EGLE).

This approval is contingent upon compliance with the following conditions:

1. The application of alum to Hess Lake will be in accordance with the standard operating procedures, dosing, and timeframe information outlined in the approved workplan. If dosing needs altered pending a jar test, applicant will request EGLE approval via e-mail request to Sara Nedrich, EGLE, at NedrichS@Michigan.gov.

2. Monitoring requirements will be met in accordance with the approved workplan. All monitoring data shall be submitted via e-mail to Sara Nedrich, EGLE, at NedrichS@Michigan.gov within three months of project completion.

3. The Newaygo County Drain Commissioner shall notify Sara Nedrich, Toxicologist, at 517-242-4989 or NedrichS@Michigan.gov, and Audrey Kirk, Grand Rapids District Supervisor, EGLE, at 616-401-1641 or KirkA3@Michigan.gov, prior to the start of the project.

4. The Newaygo County Drain Commissioner shall immediately notify Audrey Kirk, Grand Rapids District Supervisor, EGLE, at 616-401-1641, if any of the above conditions of this Certification of Approval are not, or may not be, met.

The issuance of this Certification of Approval does not authorize violation of any federal, state, or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other EGLE permits, or approvals from other units of government, as may be required by law.

This Certification of Approval is being issued on April 20, 2022, and shall expire at midnight on September 30, 2024.

Sara Nedrich

Sara Nedrich, Toxicologist
Water Toxics Unit
Surface Water Assessment Section
Water Resources Division

Hess Lake Alum Treatment Application for Rule 97 Certification

Description and purpose of the proposed water resource management project. A copy of any relevant standard operating procedures should be provided, if available.

Historically, Hess Lake supported abundant rooted plant growth. However, in recent years, rooted vegetation that was once prevalent in the lake has been replaced by persistent algae blooms and poor water clarity which are preventing the establishment of rooted plants in the lake. The cyanobacteria (i.e., blue-green algae) that are currently dominant in the lake have the potential to pose public health concerns and elevated cyanotoxin levels have been measured in the lake. A treatment of Hess Lake with aluminum sulfate (alum) is proposed to remove phosphorus and suspended sediment from the water column, improve water transparency, and promote the re-establishment of macrophytes in the lake. The intent of the alum treatment is to shift Hess Lake from phytoplankton dominance toward macrophyte dominance.

With respect to operating procedures, alum will be applied from a customized barge, equipped with an application boom. The vessel will have an application rate of 30,000 gallons per day and the minimum application water depth will be two feet.

The alum will be stored onboard the vessel in polyethylene tanks. Onboard pumps will supply the alum to application ports on spray bars. All piping will be stainless steel or heavy-duty HDPE tubing. Type 316 stainless-steel fittings will be used in areas where contact with liquid alum is anticipated. All couplings and connectors for distribution lines, storage tanks, pump and injector units will meet corrosion resistance standards for alum.

Alum injection lines with jet nozzles will be suspended from the application boom and will penetrate the water surface. The alum will be injected under pressure to flash mix with lake water.

If any observed toxic effects are readily observed (i.e., dead fish floating to surface), treatment will be stopped and applicant will consult with EGLE (Sara Nedrich – NedrichS@michigan.gov) to adjust dosing if needed.

The pumping system on the application vessel will be automatically controlled by a GPS system that varies the flow rate with boat speed and bathymetric measurements to ensure the target dose rate of alum is achieved. Water depth will be measured from the vessel by sonar. During product application, pH will be monitored in real time on the vessel on an hourly basis. In addition, pH will be measured at the surface, mid-depth, and bottom over the three deep basins in the lake immediately prior to treatment, and at 48-hours and 2 weeks post-treatment. Alum would not be applied unless the pH is homogeneous and between 6.5 and 9.0 prior to treatment.

The treatment would be conducted over a two to three day period of calm (non-windy) weather.

Please describe any available water quality data that supports the necessity of the proposed treatment. Please state whether any water quality parameters will be monitored as part of the project. If so, please describe the monitoring regime and parameters to be measured.

Historical and recent data document the highly eutrophic conditions in Hess Lake (Hess Lake Management Plan Report, Progressive AE 2020). To evaluate the effectiveness of the alum treatment, samples will be collected from the surface, mid-depth, and bottom over the three deep basins in the lake prior to the treatment and at 48-hours and 2 weeks post-treatment. Parameters measured will include temperature, dissolved oxygen, total phosphorus, and pH. In addition, during each sampling event, measurements will be made of Secchi transparency and chlorophyll *a* and the lake would be photographed. To assess attainment of management objectives, basin-wide hydroacoustic and point-intercept surveys would be conducted to measure plant biovolume and the type and relative abundance of plant species present. These data would then be compared to historical plant survey data to evaluate changes in plant cover pre- versus post-treatment.

Name and/or type of water body(ies) potentially affected by the proposed project.

Hess Lake.

Geographic location(s) of the specific water body(ies) potentially affected by the proposed project. The county, township/range/section data should be included to identify the affected site(s) location.

Hess Lake is located in Sections 4 and 5 of Grant Township and Sections 31, 32, and 33 of Brooks Township (T.11-12N; R.12W) in Newaygo County, Michigan.

Name of material(s) to be applied to the water body(ies). A Material Safety Data Sheet and product manufacturer's label should also be included. If bacteria are being used in the treatment, all bacterial strains, other ingredients, and any trace name formulations should be listed.

Liquid aluminum sulfate. Material Safety Data Sheet is attached.

Specific time period when the treatment will occur. It is acceptable for a single request to cover multiple treatment applications scheduled over an extended time period (e.g., ten treatments of water body(ies) planned from April to November with a spacing of three to four weeks between treatments).

The project is tentatively scheduled to be conducted over a two to three day period in March or April of 2024 prior to warmwater fish spawning and once water temperatures have reached 42 degrees F (to maximize alum floc formation).

Total load(s) and dosage concentration(s) of the materials to be applied to the water body(ies). If the proposed dosage deviates from dosage recommendations on the manufacturer's label, a brief explanation should be provided.

Aluminum sulfate is proposed to be applied at a rate of approximately 8 mg Al/L or 28.35 g Al/m^2, or 228,378 gallons of aluminum sulfate over the entire lake surface pending the results of jar tests. This dose is designed to bind and remove phosphorus from the water column and is well below the alum dose typically applied to prevent internal phosphorus loading from anoxic deep water sediments.

The surface area of the water body(ies) that will potentially be affected by the treatment.

Hess Lake has a surface area of 777 acres. The portion of the lake greater than 2 feet (approximately 740 acres) are proposed to be treated with alum.

The name and contact information for the company selling the material to the applicant.

The aluminum sulfate treatment will tentatively be conducted by:

HAB Aquatic Solutions
735 S. 56th Street, Suite 2
Lincoln, NE 68510
Phone: 402-430-0352

Lake ownership information, whether public or private. If private, what individual, group, or company has ownership.

Hess Lake is a public inland lake. This project is being coordinated by the Hess Lake Improvement Board under provisions of Part 309 (Inland Lake Improvements) of the Natural Resources and Environmental Protection Act, PA 451 of 1994.