

Aquatic Plant Management

NOTE: Missing or incomplete fields are highlighted at the bottom of each page. You may save, close and return to your draft permit as often as necessary to complete your application. If there are no updates in 90 days, your draft is deleted

This Application has been Signed and Submitted by: i:0#.f|wamsmembership|amykay82 signed on 2022-04-22T11:40:39

Site or Project Name:

Lake Shangri-La

The permit application will be saved automatically with this name

Activity:

Chemical Control Application

Eligibility:

(All questions must be no for it to be considered a private pond.)

Is there more than one property owner?

Yes No

Will there be uncontrolled surface water discharge?

Yes No

Does the water body have public access?

Yes No

Enter previous years permit information below to import Contact Information (Optional)

3200-004 Chemical Aquatic Control Application

NOTE: To be considered a private pond, a waterbody must meet all of the following requirements:

1. Confined to one property owner.
2. The pond has no uncontrolled surface water discharge.
3. No public access.

Upon submittal of your permit application, a **non-refundable \$20 permit processing fee will be charged**. Additional acreage fees will be refunded if the permit request is denied or if no treatment occurs.

3200-004 Chemical Aquatic Plant Control Application

- Annually complete all pages on Form 3200-004 for chemical plant management applications. Complete form 3200-004a for large scale treatments(exceeds 10.0 acres in size or 10% of the area of the water body that is 10 feet or less in depth) as required by NR107.04(3).
 - Form 3200-004 is completed electronically through this system.
 - Form 3200-004a must be completed outside the system and uploaded to the attachments section. Please refer to this link for a copy of this form: <http://dnr.wi.gov/files/pdf/forms/3200/3200-004A.pdf>
- Attach a map that shows the treatment location(s), treatment dimensions and riparian landowners. If requesting WPDES coverage, attach a water body map that shows surface outflow and receiving waters.
- For a large-scale treatment, attach evidence that a public notice has been published in a regional / local newspaper and if required that a public informational meeting has been conducted as defined in NR107.04(3).
- Pay fee online.
- Sign and Submit form.
- A signed permit application certifies to the Department that a copy of the application has been provided to any affected property owner's association/district and to landowners adjacent to treatment area.

Contact Information

Applicant Information

Organization Lake Shangri-La Property Owners Association

Last Name: Helton

First Name: Dave

Mailing Address: 22112 121st Street

City: Bristol

State: WI

Zip Code: 53105

Email:

Phone Number:
(xxx-xxx-xxxx)

Alternative Phone Number:
(xxx-xxx-xxxx)

Waterbody Address

Last Name: Helton

First Name: Dave

Street Address: 22206 120th Street

City: Bristol

State: WI

Zip Code: 53104

Email:

Phone Number:
(xxx-xxx-xxxx)

Alternative Phone Number:
(xxx-xxx-xxxx)

Applicator

Name of Applicator Firm: Clarke Aquatic Services

Applicator Certification #: 208944, 469529, 484159, 315594

Business Location License #: 93-018750

Restricted Use Pesticide #:

Address: 159 North Garden Avenue

City: Roselle

State: IL

Zip: 60172

Email: akay@clarke.com, jstoltzner@clarke.com, srodriguez@cla...

Phone Number: 630-671-3184
(xxx-xxx-xxxx)

Adjacent Riparian Property Owners or Other Individuals Sponsoring Removal

Individuals and organizations (e.g. Lake District, Lake Association, Property Owners Association, County Department of Recreation), sponsoring removal.

NOTE: Phone and email address are optional fields. This information will be publicly viewable if provided on this application.

Uploaded riparian owners to attachment tab

Name	Address	Phone	Email Address
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Site Information - Complete

Water Body to be Treated

Waterbody Property Owners Association or Waterbody District Representative :

Dave Helton

None

Water Body Name:

Lake Shangri-La-Benet Lake

County:

Kenosha

Latitude:

42.5075499

Longitude:

-88.0708524

Section:

31

Township:

01

Range:

20

Direction:

E W

Waterbody Surface Area:

184 acres

Estimated Surface area that is 10ft or less

acres

Proposed Treatment Area

Area(s) Proposed for Control:

Site Name (Optional)	Treatment Length	Treatment Width	Estimated Acreage	Average Depth	Calculated Volume
<input type="text"/>	0 ft. x	0 ft.	$\div 43,560 \text{ ft}^2 =$ 65.00 ac	4 ft =	260.00 ac-ft
			Estimated Acreage Grand Total	Calculated Volume Grand Total	65.00 ac 260.00 ac-ft

Is the area with in or adjacent to a sensitive area designated by the Department of Natural Resources.

Yes No

If the estimated acreage is greater than 10 acres, or is greater than 10 percent of the estimated area 10 feet or less in depth in Section II, complete and attach Form 3200-004A, Large-Scale Treatment Worksheet.

Chemical Aquatic Plant Control Information - Form 3200-004 (R 2/17)

Notice: Use of this form is required by the Department for any application filed pursuant to s. 281.17(2), Wis. Stats., and Chapters NR 107, 200 and 205, Wis. Adm. Code. This permit application is required to request coverage for pollutant discharge into waters of the state. Personally identifiable information on this form may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Is this permit being requested in accordance with an approved Aquatic Plant Management Plan?

Yes No

Treatment Type:

Lake Pond Wetland Marina Other

Goal of Aquatic Plant Control:

- Maintain navigation channel
- Maintain boat landing and carry in access
- Improve fish habitat
- Maintain swimming area
- Control of invasive exotics
- Other

Nuisance Caused By:

- Algae
- Emergent water plants (majority of leaves & stems growing above water surface, e.g. cattail, bulrushes)
- Floating water plants (majority of leaves floating on water surface, e.g., water lilies, duckweed)
- Submerged water plants (leaves & stems below surface, flowering parts may be exposed: milfoil, coontail)
- Other

List Target Plants

- | | | |
|---|---|--|
| <input checked="" type="checkbox"/> Algae | <input type="checkbox"/> Flowering Rush | <input type="checkbox"/> Purple Loosestrife |
| <input type="checkbox"/> Common/Glossy Buckthorn | <input type="checkbox"/> Hybrid Cattail | <input type="checkbox"/> Reed Canary Grass |
| <input type="checkbox"/> Coontail | <input checked="" type="checkbox"/> Hybrid Watermilfoil | <input type="checkbox"/> Reed Manna Grass |
| <input checked="" type="checkbox"/> Curly-Leaf Pondweed | <input type="checkbox"/> Japanese Knotweed | <input type="checkbox"/> Starry Stonewort |
| <input type="checkbox"/> Duckweed | <input type="checkbox"/> Naiad | <input type="checkbox"/> Yellow Floating Heart |
| <input type="checkbox"/> Elodea | <input type="checkbox"/> Narrow-Leaf Cattail | <input type="checkbox"/> Yellow Iris |
| <input checked="" type="checkbox"/> Eurasian Watermilfoil | <input type="checkbox"/> Phragmites | <input type="checkbox"/> Pondweed |

Other Target Plants:

2022 will most likely be CLP only, algae and EWM/HWM listed in the case they impact recreational activities and navigation.

Note: Different plants require different chemicals for effective treatment. Do not purchase chemical before identifying plants.

Chemical Control

Full Trade Name of Proposed Chemical(s)

- | | | | |
|---|-------------------------------------|---|------------------------------------|
| <input type="checkbox"/> Agristar 2,4-D Amine | <input type="checkbox"/> Clipper | <input checked="" type="checkbox"/> K-Tea | <input type="checkbox"/> SCI-62 |
| <input type="checkbox"/> Algimycin PWF | <input type="checkbox"/> Clipper SC | <input type="checkbox"/> Littora | <input type="checkbox"/> Sculpin G |

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> Alligare 2,4-D | <input type="checkbox"/> Current | <input type="checkbox"/> Milestone | <input type="checkbox"/> SeClear |
| <input type="checkbox"/> Alligare Argos | <input type="checkbox"/> Cutrine-Plus | <input type="checkbox"/> Nautique | <input type="checkbox"/> SeClear G |
| <input type="checkbox"/> Alligare Diquat | <input type="checkbox"/> Cutrine-Plus Granular | <input type="checkbox"/> Navigate | <input type="checkbox"/> Shoreklear-Plus |
| <input type="checkbox"/> Alligare Ecomazapyr | <input type="checkbox"/> Cutrine-Ultra | <input type="checkbox"/> Navitrol | <input type="checkbox"/> Shredder Amine |
| <input type="checkbox"/> Alligare Glyphosate 5.4 | <input type="checkbox"/> DMA 4 IVM | <input type="checkbox"/> Navitrol DPF | <input type="checkbox"/> Sonar AS |
| <input type="checkbox"/> Aqua Neat | <input type="checkbox"/> Earthtec | <input type="checkbox"/> Phycomycin SCP | <input type="checkbox"/> Sonar Genesis |
| <input type="checkbox"/> Aqua Star | <input type="checkbox"/> Element 3A | <input type="checkbox"/> Polaris | <input type="checkbox"/> Sonar H4C |
| <input type="checkbox"/> AquaPro | <input type="checkbox"/> Flumioxazin 51% WDG | <input type="checkbox"/> Polaris AC | <input type="checkbox"/> Sonar PR |
| <input type="checkbox"/> Aquashade | <input type="checkbox"/> Formula F-30 | <input type="checkbox"/> Pond-Klear | <input type="checkbox"/> Sonar Q |
| <input type="checkbox"/> Aquashadow | <input type="checkbox"/> Garlon 3A | <input checked="" type="checkbox"/> ProcellaCOR EC | <input type="checkbox"/> Sonar RTU |
| <input type="checkbox"/> Aquastrike | <input type="checkbox"/> Green Clean | <input type="checkbox"/> Refuge | <input type="checkbox"/> Sonar SRP |
| <input checked="" type="checkbox"/> Aquathol K | <input type="checkbox"/> Habitat | <input type="checkbox"/> Renovate 3 | <input type="checkbox"/> SonarOne |
| <input type="checkbox"/> Aquathol Super K | <input type="checkbox"/> Harpoon | <input type="checkbox"/> Renovate LZR | <input type="checkbox"/> Stingray |
| <input type="checkbox"/> Avast! SC | <input type="checkbox"/> Harvester | <input type="checkbox"/> Renovate LZR Max | <input type="checkbox"/> Symmetry NXG |
| <input type="checkbox"/> Captain | <input type="checkbox"/> Havoc Amine | <input type="checkbox"/> Renovate Max G | <input type="checkbox"/> Touchdown Pro |
| <input type="checkbox"/> Captain XTR | <input type="checkbox"/> Hydrothol 191 | <input type="checkbox"/> Renovate OTF | <input type="checkbox"/> Tribune |
| <input type="checkbox"/> Chinook | <input type="checkbox"/> Hydrothol Granular | <input type="checkbox"/> Reward | <input type="checkbox"/> Trycera |
| <input type="checkbox"/> Clearcast | <input type="checkbox"/> Komeen | <input type="checkbox"/> Rodeo | <input type="checkbox"/> Weedar 64 |
| <input type="checkbox"/> Cleargate | <input type="checkbox"/> Komeen Crystal | <input type="checkbox"/> Roundup Custom | <input type="checkbox"/> Weedestroy AM-40 |

Other Proposed Chemical(s):

Have the proposed chemicals been permitted in a prior year on the proposed site?
 All Some None

What were the results of the treatment?

Method of Application:

NOTE: Chemical fact sheets for aquatic pesticides used in Wisconsin are available from the Department of Natural Resources upon request.

Alternatives to Chemical Control:	Feasible?	If No, Why Not?
1. Mechanical harvesting	<input type="radio"/> Yes <input checked="" type="radio"/> No	fragmentation of plants spread AIS
2. Manual removal	<input type="radio"/> Yes <input checked="" type="radio"/> No	area too large, too expensive
3. Sediment screens/covers	<input type="radio"/> Yes <input checked="" type="radio"/> No	area too large, prevents beneficial plant growth
4. Dredging	<input type="radio"/> Yes <input checked="" type="radio"/> No	too expensive
5. Waterbody drawdown	<input type="radio"/> Yes <input checked="" type="radio"/> No	not site specific
6. Nutrient controls in watershed	<input type="radio"/> Yes <input checked="" type="radio"/> No	not site specific
7. Other:	<input type="radio"/> Yes <input checked="" type="radio"/> No	N/A

Note: If proposed treatment involves multiple properties, consider feasibility of EACH alternative for EACH property owner.

Will surface water outflow and/or overflow be controlled to prevent chemical loss?

Yes No

Is the treatment area greater than 5% of surface area?

Yes No

Waterbody concentration calculations (in ppm.)

Refer to DNR Waterbody pages <http://dnr.wi.gov/lakes> to answer the following:

Does the waterbody stratify? Yes No

- If yes, calculate whole waterbody concentration using volume above thermocline.
- If no, calculate whole waterbody concentration using total lake value

Whole Waterbody Concentration ppm

WPDES Permit Request

Is WPDES coverage being requested? Refer to

<http://dnr.wi.gov/topic/wastewater/aquaticpesticides.html> for more information

Yes - complete section VII with signature.

No

Already have WPDES





WPDES coverage not needed

Required Attachments and Supplemental Information

Upload Required Attachments (15 MB per file limit) - [Help reduce file size and trouble shoot file uploads](#)

* indicates completion of this item is required

Note: To add additional attachments using the down arrow icon. To replace an existing file, use the 'Click here to attach file ' link. To remove additional items, select the item and press CNTRL Delete.

Riparian Owners	 File Attachment	LakeFrontPropertyOwnerAddresses-March252022.xlsx
Public Notice	 File Attachment	LakeShangri-La2022ProofofPublication.pdf
Large Scale Worksheet	 File Attachment	
Site Map	 File Attachment	LakeShangri-LaBenetLake2022PotentialTreatmentAreaMap.pdf

Fee Calculation

Chemical Control Application

1. s. NR 107.11(1), Wis. Adm. Code, lists the conditions under which the permit fee is limited to the \$20 minimum charge.
2. s. NR 107.11(4), Wis. Adm. Code, lists the uses that are exempt from permit requirements.
3. s. NR 107.04(2), Wis. Adm. Code, provides for a refund of acreage fees if the permit is denied or if no treatment occurs.

If Proposed treatment is over 0.25, calculate acreage fee: (round up to nearest whole acre, to maximum of 50 acres) acres X \$25 per acre = \$	65.00
If proposed treatment is less than 0.25 acre, acreage fee is \$0	\$1,250.00
Basic Permit Fee (non-refundable)	\$20.00
Total Fee	\$1,270

Payment Information

Invoice Number: WP-00035066

Payment Confirmation Number: WS2WT3008350891

Amount Paid: \$1,270

Sign and Submit

Applicant Responsibilities and Certification

1. The applicant has prepared a detailed map which shows the length, width and average depth of each area proposed for the control of rooted vegetation and the surface area in acres or square feet for each proposed algae treatment.
2. The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management project involving chemicals. Under s.NR 107.07 Wis. Adm. Code, supervision may include inspection of the proposed treatment area, chemicals and application equipment before, during or after treatment. The applicant is required to notify the regional office 4 working days in advance of each anticipated treatment with the date, time, location and size of treatment unless the Department waives this requirement. Do you request the Department to waive the advance notification requirement?
 Yes No
3. The applicant agrees to comply with all terms or conditions of this permit, if issued, as well as all provisions of Chapter NR 107, Wis. Adm. Code. The required application fee is attached.
4. The applicant will provide a copy of the current application to any affected property owners' association inland Lake District and, in the case of chemical applications for rooted aquatic plants, to all owners of property riparian or adjacent to the treatment area. The applicant has also provided a copy of the current chemical fact sheet for the chemicals proposed for use to any affected property owner's association or inland Lake District.
5. Conditions related to invasive species movement. The applicant and operator agree to the following methods required under s.NR 109.05(2), Wis. Adm. Code for controlling, transporting and disposing of aquatic plants and animals, and moving water:
 - Aquatic plants and animals shall be removed and water drained from all equipment as required by s.30.07, Wis. Stats., and ss. NR 19.055 and 40.07, Wis. Adm. Code.
 - Operator shall comply with the most recent Department-approved 'Boat, Gear, and Equipment Decontamination and Disinfection Protocol', Manual Code #9183.1, available at <http://dnr.wi.gov/topic/invasives/disinfection.html>

All portions of this permit, map and accompanying cover letter must be in possession of the chemical applicator at the time of treatment. During treatment all provisions of Chapter NR 107 107.07 and NR 107.08, Wis. Adm. Code, must be complied with, as well as the specific conditions contained in the permit cover letter.

I hereby certify that that the above information is true and correct and that copies of the application shall be provided to all affected property owners promptly and that the conditions of the permit will be adhered to. All portions of this permit, map and accompanying cover letter must be in possession of the applicant or their agent at time of plant removal. During plant removal activities, all provisions of applicable Wisconsin Administrative Rules must be complied with, as well as the specific conditions contained in the permit cover letter.

Steps to Complete the signature process

IMPORTANT: All email correspondence will be sent to the address associated with your WAMS ID).

1. Read and Accept the Responsibilities and Certification
2. Press the Initiate Signature Process button
3. Open the confirmation email for a one time confirmation code and instructions to complete the signature process.

You will receive a final acknowledgement email upon completing these steps .

Check if you are signing as Agent for Applicant.

i:0#.f|wamsmembership|amykay82 signed on 2022.

I hereby certify that the above information is true and correct and that copies of this submittal shall be provided to the appropriate parties named in the contact section and that the conditions of the permit and pesticide use will be adhered to.

Affidavit of Printing State of Wisconsin

County of Kenosha

City of Twin Lakes

Southern Lakes Newspapers, LLC, certifies that it is the publisher of the Twin Lakes (Report Group); that such paper is a secular newspaper of general circulation in said county; that it is printed and published in the village/city, county and state aforesaid. It hereby further certifies that a notice, of which the attached notice is a true copy, has been legally published in said newspaper 1 time(s) for 1 consecutive week(s); That the first publication was on the 15th day of April, 2022; The last publication was on the 15th day of April, 2022.

Signed _____

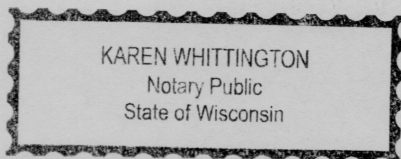
By Denelle Janssen, for Southern Lakes Newspapers, LLC

Subscribed and sworn to before me this

20 day of April 2022

Notary Public, State of Wisconsin

My commission expires 11/20/26



PUBLIC NOTICE
The Lake Shangri-La Property Owners Association (the Association) proposes to manage excessive growth of the exotic invasive aquatic plants, Eurasian Watermilfoil, Curlyleaf Pondweed, and/or algae should navigational constraints ensue with aquatic pesticides on up to 70 acres of Lake Shangri-La/Benet Lake. Clarke Aquatic Services will conduct an application of endohall, floryprauxifen-benzyl, and/or chelated copper algaecide sometime in spring, 2022 and will proceed only after the Association obtains a permit for the treatment from the Wis-

consin Department of Natural Resources.
The water use restrictions for the pesticides noted above are as follows: There are no swimming, fishing or other recreational restrictions. Do not use water from treated areas for irrigation purposes for up to 5 days following application. Date of application, product(s) used and irrigation restrictions if any will be posted within and adjacent to the treatment areas and at public access points on the lake.
The Association will hold a public informational meeting on the proposed management of five or more individuals, organizations,

special units of government, or local units of government request one in writing. The person or entity requesting the meeting shall state a specific agenda of topics including problems and alternatives to be discussed. The request for a public informational meeting must be sent in writing to Lake Shangri-La POA, 22112 121st Street, Bristol, WI 53105 and to Wisconsin Department of Natural Resources, 141 NW Barstow St, Rm 180, Waukesha, WI 53188 within 5 days after the public notice is published.
(Published in The Report
April 15, 2022
WNAAXLP - 415860)

LAKE SHANGRI-LA AND BENET LAKE 2021 AIS CONTROL PROJECT SITES & POTENTIAL 2022 CLP MANAGEMENT AREAS TO BE REFINED AND SUBMITTED FOLLOWING SPRING SURVEY



Endothall Chemical Fact Sheet

Formulations

Endothall is the common name of the active ingredient endothal acid (7-oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid). Endothall products are used to control a wide range of terrestrial and aquatic plants. Both granular and liquid formulations of endothall are available for aquatic use in Wisconsin. Two types of endothall are available: dipotassium salt (such as Aquathol®) and monoamine salts (such as Hydrothol 191). Trade names are provided for your reference only and are neither exhaustive nor endorsements of one product over another.

Aquatic Use and Considerations

Endothall is a contact herbicide that prevents certain plants from making the proteins they need. Factors such as density and size of the plants present, water movement, and water temperature determine how quickly endothall works. Under favorable conditions, plants begin to weaken and die within a few days after application.

Endothall products vary somewhat in the target species they control, so it is important to always check the product label for the list of species that may be affected. Endothall products are effective on Eurasian watermilfoil (*Myriophyllum spicatum*) and also kill desirable native species such as pondweeds (*Potamogeton* spp.) and coontail (*Ceratophyllum* spp.). In addition, Hydrothol 191 formulations can also kill wild celery (*Vallisneria americana*) and some species of algae (*Chara*, *Cladophora*, *Spirogyra*, and *Pithophora*).

Endothall will kill several high value species of aquatic plants (especially *Potamogeton* spp.) in addition to nuisance species. The plants that offer important values to aquatic ecosystems often resemble, and may be growing with those plants targeted for treatment. Careful identification of plants and application of

endothall products is necessary to avoid unintended harm to valuable native species.

For effective control, endothall should be applied when plants are actively growing. Most submersed weeds are susceptible to Aquathol formulations. The choice of liquid or granular formulations depends on the size of the area requiring treatment. Granular is more suited to small areas or spot treatments, while liquid is more suitable for large areas.

If endothall is applied to a pond or enclosed bay with abundant vegetation, no more than 1/3 to 1/2 of the surface should be treated at one time because excessive decaying vegetation may deplete the oxygen content of the water and kill fish. Untreated areas should not be treated until the vegetation exposed to the initial application decomposes.

Post-Treatment Water Use Restrictions

Due to the many formulations of this chemical the post-treatment water use restrictions vary. Each product label must be followed. For all products there is a drinking water standard of 0.1 ppm and can not be applied within 600 feet of a potable water intake. Use restrictions for Hydrothol products have irrigation and animal water restrictions.

Herbicide Degradation, Persistence and Trace Contaminants

Endothall disperses with water movement and is broken down by microorganisms into carbon, hydrogen, and oxygen. Field studies show that low concentrations of endothall persist in water for several days to several weeks depending on environmental conditions. The half-life (the time it takes for half of the active ingredient to degrade) averages five to ten days. Complete degradation by microbial action is 30-60 days. The initial breakdown product of endothall is an amino acid, glutamic acid, which is rapidly consumed by bacteria.

Impacts on Fish and Other Aquatic Organisms

At recommended rates, the dipotassium salts (Aquathol and Aquathol K) do not have any apparent short-term effects on the fish species that have been tested. In addition, numerous studies have shown the dipotassium salts induce no significant adverse effects in aquatic invertebrates (such as snails, aquatic insects, and crayfish) when used at label application rates. However, as with other herbicide use, some plant-dwelling populations of aquatic organisms may be adversely affected by application of endothall formulations due to habitat loss.

In contrast to the low toxicity of the dipotassium salt formulations, laboratory studies have shown the monoamine salts (Hydrothol 191 formulations) are toxic to fish at dosages above 0.3 parts per million (ppm). In particular, the liquid formulation will readily kill fish present in a treatment site. By comparison, EPA approved label rates for plant control range from 0.05 to 2.5 ppm. In recognition of the extreme toxicity of the monoamine salt, product labels recommend no treatment with Hydrothol 191 where fish are an important resource.

Other aquatic organisms can also be adversely affected by Hydrothol 191 formulations depending upon the concentration used and duration of exposure. Tadpoles and freshwater scuds have demonstrated sensitivity to Hydrothol 191 at levels ranging from 0.5 to 1.8 ppm.

Findings from field and laboratory studies with bluegills suggest that bioaccumulation of dipotassium salt formulations by fish from water treated with the herbicide is unlikely. Tissue sampling has shown residue levels become undetectable a few days after treatment.



Human Health

Most concerns about adverse health effects revolve around applicator exposure. Liquid endothall formulations in concentrated form are highly toxic. Because endothall can cause eye damage and skin irritation, users should minimize exposure by wearing suitable eye and skin protection.

At this time, the EPA believes endothall poses no unacceptable risks to water users if water use restrictions are followed. EPA has determined that endothall is not a neurotoxicant or mutagen, nor is it likely to be a human carcinogen.

For Additional Information

Environmental Protection Agency
Office of Pesticide Programs
www.epa.gov/pesticides

Wisconsin Department of Agriculture, Trade,
and Consumer Protection
<http://datcp.wi.gov/Plants/Pesticides/>

Wisconsin Department of Natural Resources
608-266-2621
<http://dnr.wi.gov/lakes/plants/>

Wisconsin Department of Health Services
<http://www.dhs.wisconsin.gov/>

National Pesticide Information Center
1-800-858-7378
<http://npic.orst.edu/>



Florpyrauxifen-benzyl Chemical Fact Sheet

Formulations

Florpyrauxifen-benzyl was registered with the EPA for aquatic use in 2017. The active ingredient is 2-pyridinecarboxylic acid, 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoro-, phenyl methyl ester. The current Wisconsin-registered formulation is a liquid (ProcellaCOR™ EC) solely manufactured by SePRO Corporation.

Aquatic Use and Considerations

Florpyrauxifen-benzyl is a systemic herbicide that is taken up by aquatic plants. The herbicide is a member of a new class of synthetic auxins, the arylpicolinates, that differ in binding affinity compared to other currently registered synthetic auxins. The herbicide mimics the plant growth hormone auxin that causes excessive elongation of plant cells that ultimately kills the plant. Susceptible plants will show a mixture of atypical growth (larger, twisted leaves, stem elongation) and fragility of leaf and shoot tissue. Initial symptoms will be displayed within hours to a few days after treatment with plant death and decomposition occurring over 2 – 3 weeks. Florpyrauxifen-benzyl should be applied to plants that are actively growing; mature plants may require a higher concentration of herbicide and a longer contact time compared to smaller, less established plants.

Florpyrauxifen-benzyl has relatively short contact exposure time (CET) requirements (12 – 24 hours typically). The short required CET may be advantageous for localized treatments of submersed aquatic plants, however, the target species efficacy compared to the size of the treatment area is not yet known.

In Wisconsin, florpyrauxifen-benzyl may be used to treat the invasive Eurasian watermilfoil (*Myriophyllum spicatum*) and hybrid Eurasian watermilfoil (*M. spicatum* X *M. sibiricum*). Other

invasive species such as floating hearts (*Nymphoides* spp.) are also susceptible. In other parts of the country, it is used as a selective, systemic mode of action for spot and partial treatment of the invasive plant hydrilla (*Hydrilla verticillata*). Desirable native species that may also be negatively affected include waterlily species (*Nymphaea* spp. and *Nuphar* spp.), pickerelweed (*Pontederia cordata*), and arrowhead (*Sagittaria* spp.).

It is important to note that repeated use of herbicides with the same mode of action can lead to herbicide-resistant plants, even in aquatic plants. Certain hybrid Eurasian watermilfoil genotypes have been documented to have reduced sensitivity to aquatic herbicides. In order to reduce the risk of developing resistant genotypes, avoid using the same type of herbicides year after year, and utilize effective, integrated pest management strategies as part of any long-term control program.

Post-Treatment Water Use Restrictions

There are no restrictions on swimming, eating fish from treated waterbodies, or using water for drinking water. There is no restriction on irrigation of turf. Before treated water can be used for non-agricultural irrigation besides turf (such as shoreline property use including irrigation of residential landscape plants and homeowner gardens, golf course irrigation, and non-residential property irrigation around business or industrial properties), follow precautionary waiting periods based on rate and scale of application, or monitor herbicide concentrations until below 2 ppb. For agricultural crop irrigation, use analytical monitoring to confirm dissipation before irrigating. The latest approved herbicide product label should be referenced relative to irrigation requirements.

Herbicide Degradation, Persistence and Trace Contaminants

Florpyrauxifen-benzyl is broken down quickly in the water by light (i.e., photolysis) and is also subject to microbial breakdown and hydrolysis. It has a half-life (the time it takes for half of the active ingredient to degrade) ranging from 1 – 6 days. Shallow clear-water lakes will lead to faster degradation than turbid, shaded, or deep lakes.

Florpyrauxifen-benzyl breaks down into five major degradation products. These materials are generally more persistent in water than the active herbicide (up to 3 week half-lives) but four of these are minor metabolites detected at less than 5% of applied active ingredient. EPA concluded no hazard concern for metabolites and/or degradates of florpyrauxifen-benzyl that may be found in drinking water, plants, and livestock.

Florpyrauxifen-benzyl binds tightly with surface sediments, so leaching into groundwater is unlikely. Degradation products are more mobile, but aquatic field dissipation studies showed minimal detection of these products in surface sediments.

Impacts on Fish and Other Aquatic Organisms

Toxicity tests conducted with rainbow trout, fathead minnow, water fleas (*Daphnia* sp.), amphipods (*Gammarus* sp.), and snails (*Lymnaea* sp.) indicate that florpyrauxifen-benzyl is not toxic for these species. EPA concluded florpyrauxifen-benzyl has no risk concerns for non-target wildlife and is considered "practically non-toxic" to bees, birds, reptiles, amphibians, and mammals.

Florpyrauxifen-benzyl does not bioaccumulate in fish or freshwater clams due to rapid metabolism and chemical depuration.



Human Health

EPA has identified no risks of concern to human health since no adverse acute or chronic effects, including a lack of carcinogenicity or mutagenicity, were observed in the submitted toxicological studies for florpyrauxifen-benzyl regardless of the route of exposure. EPA concluded with reasonable certainty that drinking water exposures to florpyrauxifen-benzyl do not pose a significant human health risk.

For Additional Information

Environmental Protection Agency Office of Pesticide Programs
www.epa.gov/pesticides

Wisconsin Department of Agriculture, Trade, and Consumer Protection
<http://datcp.wi.gov/Plants/Pesticides/>

Wisconsin Department of Natural Resources
608-266-2621
<http://dnr.wi.gov/lakes/plants/>

National Pesticide Information Center
1-800-858-7378
<http://npic.orst.edu/>

Washington State Department of Ecology. 2017.
<https://fortress.wa.gov/ecy/publications/documents/1710020.pdf>



Copper Compounds

Chemical Fact Sheet

Formulations

Copper has been used as an aquatic herbicide and algaecide since 1950. Copper compounds for aquatic use are manufactured either as copper sulfate, or as a copper chelate. Both forms contain metallic copper as the active ingredient, but in the chelate forms the copper is combined with other compounds to keep the copper in solution and active in the water longer. Chelated copper is also less toxic to non-target organisms.

There are copper sulfate products available as fungicides and other terrestrial uses, which are not allowed for use in water. Aquatic copper products are sold under a variety of brand names, including Nautique™, Komeen®, Captain™, K-Tea™, Eartheq®, Cutrine®-Plus, Clearigate® and SeClear (product names are provided solely for your reference and should not be considered endorsements nor exhaustive).

Aquatic Use and Considerations

Copper products are primarily used to treat algae but certain formulations will affect some plants, as well. The target species vary by product, so it is important to confirm that the intended target is listed on the label of the product being used.

Copper works by interfering with enzyme production. Results from treatments for algae occur within hours, while the effects of treatment on plants will be evident in about a week. Large-scale algae die-off can deplete oxygen levels in the water quickly, which can be lethal to fish and other aquatic life. If more than a 1/3 of the total water area is covered in algae, treatments should be done in sections, and applied in a pattern that allows fish an escape route to untreated water. Ten to fourteen days are needed between treatments to protect fish and aquatic life.

Copper products will treat blue-green (free-floating) algae and filamentous (mat-forming)



algae as well as larger algae species that look like plants, such as *Chara* spp. and *Nitella* spp.. In Wisconsin, copper is not typically used to treat aquatic plants, but some are labeled to treat the invasives Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*), as well as the native species coontail (*Ceratophyllum demersum*), naiads (*Najas* spp.), elodea (*Elodea canadensis*), sago pondweed (*Stuckenia pectinata*) and water celery (*Vallisneria americana*).

Determining the correct copper formulation and calculating the proper dosage are key factors in determining how well copper will control undesirable algae. Applicators need to consider target species, water hardness, water temperature, amount of algae present, as well as water clarity and flow.

In hard or alkaline waters, copper sulfate tends to settle to the bottom within 24 hours after application. Chelated copper remains in solution longer, allowing for a longer contact time with the algae.

All copper formulations can be toxic to some species of fish at recommended application rates, especially if the water has less than 50 ppm (parts per million) of carbonate hardness (soft water). However, toxicity generally decreases as water hardness increases.

Post-Treatment Water Use Restrictions

There are no restrictions on swimming, eating fish from treated water bodies, human drinking water, pet/livestock drinking water, or irrigation.

Herbicide Degradation, Persistence and Trace Contaminants

Copper is an element, and so is not broken down like other herbicides. Copper precipitates out of the water over a few days and settles into the sediments, where it persists indefinitely and accumulates over time. The buildup of copper in lake sediments is a serious concern, because high concentrations of copper in the sediment are toxic to both plant and animal life.

Impacts on Fish and Other Aquatic Organisms

Copper sulfate is rarely used in Wisconsin, in part due to its high toxicity to invertebrates (water fleas, crustaceans, mollusks, mayflies, snails, and crayfish) and multiple species of fish (trout, bluegill and minnow) at typical application concentrations. The chelated forms of copper have different toxicology profiles from each other and from copper sulfate.

The chelated copper products can also be toxic to fish at application rates, particularly to trout and bluegill in soft water ($\text{CaCO}_3 < 50\text{ppm}$). Applications to harder water provide a greater margin of safety to fish.

Many of the chelated copper products are also toxic to invertebrates at application rates. High concentrations of copper in lake sediment can be toxic to invertebrates that live on the lake bottom, as well. These invertebrates are an important source of fish food.

Copper does temporarily accumulate in fish, but more in the gills and the liver than in muscle tissue. The copper in fish tissues are reduced once the copper level in the water is reduced.

The EPA risk assessment for birds and small mammals (based on dietary consumption) indicates that some risk may be present to birds or mammals at the worst-case scenario. However, this maximum dietary exposure scenario is likely much higher than the exposure

level that might occur to birds when copper is released into the environment as an algaecide. Birds, like humans, can physiologically acclimate to higher concentrations of copper in order to slow its uptake. Studies of copper's effects on birds have shown to be toxic at high levels; however, effects at standard treatment levels have not been shown to be harmful. Studies have shown that even at low levels (.07ppm) copper sulfate can have detrimental effects on amphibians, including slowed growth rates, decreased mobility and death. Effects on reptiles have not been documented.

Human Health

The risk of acute exposure to copper is primarily to chemical applicators. The acute toxicity risk from oral and inhalation routes is minimal; however concentrated copper products can be corrosive to the eyes and cause irreversible damage. Prolonged or frequent skin contact can cause allergic reactions in some people. Goggles, protective clothing, and rubber gloves are required when handling.

Even with regular use for many years, very few chronic health concerns have been documented. In one study agricultural applicators of copper were found to have some signs of liver damage, and there is some evidence that high copper may impair immune function. Copper is not carcinogenic.

For Additional Information

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