

Item 7b.

Sunfish Lake Engineer's Report for June 5, 2012

By: Don Sterna, PE, City Engineer

Date: June 3, 2012

1. Engineering Activities Undertaken in the Month of May

Crack Seal Quotes – In April the city received 5 quotes for this years crack sealing improvements. Attached to this report are the tabulated quote results along with our recommendation of award to Precision Incorporated out of Princeton, Wisconsin, in the amount of \$13,000. The Council in May wanted to know the entire project costs including engineering costs before the project is awarded. WSB incurred \$1,750 in cost to prepare the specifications and administer the quotes and we anticipate another \$1,000 to manage the contract, inspect and document the work in the field for a total of \$2,750. We are asking for the ability to overrun the quantity if we start running short to complete the work but not to exceed a total construction contract value of \$17,500. Therefore the total project costs would be \$20,250 or \$5,750 under the budgeted amount. This company has preformed similar work in the surrounding metro area communities and has a good reputation. The Quotes are valid for 45 days from the date of bid opening after which the city would need to either request new quotes or cancel the project for this year. We are recommending that the Council award the project to Precision Incorporated and approve a cost not to exceed of \$2,750 for WSB to fully administer the project.

Charlton Road Ditch and culvert Repairs – Charlton Road was re graded in April however due to the heavy rains we received in May several areas experienced erosion which carried material in to the adjacent ditches. As a result of years of similar erosion, several culverts are now either completely plugged or are close to plugged. I received a quote from Pine Bend Paving to clean the sediment out of several of the ditches for a cost not to exceed \$1950 and jet out 3 culverts for \$850. If additional driveway culverts are to be cleaned it would cost an additional \$250 per culvert for a typical culvert. There are currently 9 culverts that should be cleaned of which only 3 are with in City R/W. The other 6 culverts are under private driveways not within city dedicated R/W. Of the 6 private culverts 3 require repair to the end sections which most likely will require replacement of the metal aprons. The repair costs could range from \$250 to \$500 per culvert to repair per culvert. At this time I am asking Council approval to clean the 3 city owned culverts and remove the debris that is obstructing the ditches at the culverts for a total cost of \$2,775. Please keep in mind that at the 6 private culverts just cleaning the debris in front of the inlet will not resolve the drainage concerns without cleaning the culvert pipe.

I am asking City Council to provide direction on how they would like to proceed with cleaning and/or repair to the other 6 private culverts. The options available are as follows:

- 1.) Do nothing and notify the affected residents of their responsibility to clean the culverts to maintain roadway ditch drainage.
- 2.) Notify the affected residents of the problem and let them know the city would clean and repair the culverts with costs billed to them.
- 3.) Clean the culverts at an estimated cost not to exceed \$1750 with city funds and not repair the culvert end sections.

Salem Church Road Shoulder Repair- Over the past month the shoulder on the east end of Salem Church Road on the west side experienced additional erosion. I would like to add some additional bituminous millings and re grade and compact the shoulder. I anticipate this cost not to exceed \$750. The cost would come from the 2012 Street Maintenance Budget.

Street Pavement Repair – There is a short segment of pavement that should be patched on Salem Church Road just east of Windy Hill Road along with several other small patches that I would like to repair prior to the crack sealing project. I am requesting the Council to authorize up to \$1,500 for spot pavement repairs in the month of June. The cost would come from the 2012 Street Maintenance Budget.

Sunfish Lake Water Quality Follow Up – I wanted to follow up our last month's memo regarding Sunfish Lake Quality with two documents describing what Alum and Copper Sulfate chemicals are and how they are used for in treating water quality. I hope these documents can answer the question raised at the May Council meeting regarding Alum and Copper Sulfate treatments.

Angell Road Culvert Easements – The three (3) signed drainage easements were forwarded on to the City Attorneys office for their filing with Dakota County.

2012 CAMP Program Contract – I received the 2012 CAMP program contract that I will be asking for city Council approval and signature of at the June Council Meeting. The costs could range from the previous years \$1,200 to \$1,650 depending on the number of actual samples supplied to MPCA.

2. Public Works Activities Undertaken in the Month of May

Pavement, Culvert and Sign Evaluation- In May we completed the evaluation of the pavement condition, drainage culvert inspections and city street signs condition evaluation to assess the condition which will be used to establish a maintenance program. In June we will finalize the draft of the Infrastructure Assessment Report for council review prior to the July Council meeting. The evaluations were completed later in May which did not allow proper time to prepare the draft report. The report will contain the findings from the field evaluations along with maintenance recommendations that will guide the preparation of the City's 2012 Capital Improvement Program (CIP).

3. Anticipated Engineering and Public Works Activities for the Month of April

- **CIP Update** – The draft of the 2012 CIP will be updated based on the results of the recently completed pavement, culvert and sign evaluation report of the City's infrastructure. A revised draft will be prepared and forwarded to the Council for review and comments in early June for discussion at the July Council meeting. I would like to receive input at this meeting and then finalize the report for approval at the August Council meeting along with the draft of the 2013 Public Works Budget.
- **Acorn Drive Bituminous Repair by Xcel Energy**– I will be contacting Xcel to notify them that the repair of the pavement on Acorn Drive is not acceptable and that they need to remove and re patch the street.

The above constitutes the Engineering Report for the City of Sunfish Lake for June 2012.

Respectfully submitted,

WSB & Associates, Inc.



Donald W. Sterna, PE
City Engineer

sm



P.O. BOX 72
VERMILLION, MN 55085
651-437-2333 · FAX 651-437-7960

PROPOSAL

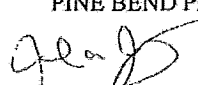
T O	City of Sunfish Lake – Att Don Sterna	DATE OF PROPOSAL 5-17-2012	PROPOSED COMPLETION DATE Soon
		JOB NAME Charlton Ditch Clean	
		JOB LOCATION SFL	

WE ARE PLEASED TO OFFER YOU MATERIALS AND SERVICES AS SHOWN BELOW, SUBJECT TO THE INDICATED TERMS. IF THIS OFFER IS NOT ACCEPTED WITHIN THIRTY DAYS, IT THEN MAY BE ACCEPTED ONLY AT OUR OPTION. YOUR ACCEPTANCE WILL BE ACCOMPLISHED BY COMPLETING AND RETURNING TO US THE ORIGINAL OF THIS FORM.

ITEM	DESCRIPTION OR SPECIFICATION	QUANTITY	PRICE	AMOUNT
	Clean out aggregates @ ends of culverts			
	Clean aggregates out of ditches			
	Load and haul away materials	Max 10 hr day		\$ 1,950.00
	ALT: Hydro Blast culverts w/ machine			
	Base bid 3 culverts (2180/2065/2078 or as per eng.)			\$ 825.00
	Additional culverts on same mob. -- add per		\$ 250.00	
NOTE	PBP manufactures it's own Asphalt and Aggregate products.			
PRICE QUOTATION BASIS		TOTAL AMOUNT		
UNIT PRICES	SQUARE YARD	TIME & MATERIAL	X LUMP SUM	

TERMS & CONDITIONS

1. THE TOTAL CONTRACT AMOUNT SHALL BE PAID WITHIN 30 DAYS AFTER THE DATE OF CONTRACTOR'S INVOICE. ANY AMOUNT UNPAID AFTER THE 30-DAY PERIOD SHALL BEAR INTEREST CHARGES OF 18% PER ANNUM UNTIL PAYMENT IS MADE IN FULL BY THE OWNER.
2. THIS CONTRACT SHALL BE COMPLETED WITH REASONABLE PROMPTNESS BY THE CONTRACTOR, BUT THE CONTRACTOR SHALL NOT BE RESPONSIBLE FOR DELAYS OR FAILURE TO COMPLETION CAUSED BY WEATHER, UNFAVORABLE TO CARRYING OUT THE WORK INVOLVED, FIRE, EXPLOSION, FAILURE OF EQUIPMENT, STRIKES, DIFFERENCES WITH WORKMEN, COMPLIANCE WITH ORDERS OF A GOVERNMENTAL AGENCY, INTERRUPTION IN DELIVERY OF MATERIALS, OR FROM ANY CAUSE BEYOND HIS REASONABLE CONTROL.
3. THE CONTRACT PRICE DOES NOT INCLUDE ANY TAXES EXCEPT AS STATED, AND ANY TAX IMPOSED BY GOVERNMENTAL AUTHORITY WHICH EFFECTS THE CONTRACT PRICE SHALL BE IN ADDITION THERETO.
4. THIS CONTRACT CONTAINS THE ENTIRE AGREEMENT BETWEEN THE PARTIES. THERE ARE NO ORAL PROMISES, AGREEMENTS, OR WARRANTIES AFFECTING IT. ANY ALTERATION OR DEVIATION FROM THE ABOVE QUANTITIES AND SPECIFICATIONS OR OTHER CHANGE IN THE CONTRACT MUST BE IN WRITING AND EXECUTED BY AUTHORITY REPRESENTATIVES OF THE PARTIES.
5. ANY PERSON OR COMPANY SUPPLYING LABOR OR MATERIALS FOR THIS IMPROVEMENT TO YOUR PROPERTY MAY FILE A LIEN AGAINST YOUR PROPERTY, IF THAT PERSON OR COMPANY IS NOT PAID FOR THE CONTRIBUTIONS. UNDER MINNESOTA STATE LAW, YOU HAVE THE RIGHT TO PAY PERSONS WHO SUPPLIED LABOR OR MATERIALS FOR THIS IMPROVEMENT DIRECTLY AND DEDUCT THIS AMOUNT FROM OUR CONTRACT PRICE, OR WITHHOLD THE AMOUNTS DUE FROM US UNTIL 120 DAYS AFTER COMPLETION OF THE IMPROVEMENT UNLESS WE GIVE YOU A LIEN WAIVER SIGNED BY PERSONS WHO SUPPLIED ANY LABOR OR MATERIAL FOR THE IMPROVEMENT AND WHO GAVE YOU TIMELY NOTICE.

PINE BEND PAVING INC.		ACCEPTED FOR OWNER	
BY TITLE 	Joe Jacoby (President)	BY TITLE	DATE

Pond Water Treatment System Using Alum

Alum refers to aluminum sulfate and is commonly used to treat ponds. When added to muggy or dense ponds the aluminum ions collect the dirt particles in the water, sink them to the ground and leave the water sparkling. Does this Spark an idea?

1. When Does Water Need Alum

- When visibility in the water becomes very low, then it needs to be cleared. For the optimal health of all aquatic life the underwater visibility needs to generally remain at 1 to 1 1/2 feet.

Required Amount of Alum

- It is recommended to use 50 lbs. of alum for every acre-foot of turbid ponds. This helps to clear the pond in 6 to 7 days.
- Sponsored Links
 - Hide ugly pond liner

Rock-on-a-Roll is a flexible sheet with the look of natural stone.

www.rock-on-a-roll.com

How to Use Alum

- For use, alum is dissolved in water and sprayed on the surface of the pond. To minimize the risk to plants and water, only 1/3 to 1/2 of the dose should be applied at first. After a couple of days it can be determined how much more alum is needed to clear the water.

Types of Alum

- The type of alum, pure or buffered, is determined by the existing level of soil alkalinity or acidity. If the water pH is under 7.0, then hydrated lime should be added with the alum. This helps to buffer the production of acid from the alum.

Reactions Caused by Alum

- When alum is added to water it creates a chemical reaction that affects the pH level of the water. This in turn produces sulfuric acid in small amounts, which significantly lowers the pH level in the water. This sudden imbalance in pH can prove harmful to fish and plants. It is hence highly recommended to test the water before starting any alum treatment.

Sponsored Links

- **Sludge Thickening Leader**www.parkson.com/sludge-thickening
Low maintenance and polymer usage. High capture rate. Watch the video!
- **Process Water Treatment**Total-Water.com
Systems for Industrial, Commercial Uses - Free Estimates
- **Municipal Water Treatment**www.easywater.com/WaterTreatment
Water Treatment System - Treat Your Water Without Salt. Call Us Today!
- **Clay-Based Flocculants**scetcooilfieldservices.com
Industrial Wastewater Treatment Treatment On-Site in 1 Simple Step

Related Searches:

- Water Treatment
- Home Water Treatment
- Water Treatment Sewage
- Waste Water Treatment Plant
- Water Treatment Systems

Read more: Pond Water Treatment System Using Alum | eHow.com
http://www.ehow.com/facts_5839661_pond-treatment-system-using-alum.html#ixzz1wMptLIAR

USALCO

Get in Touch: (410) 918-2230

Search

Submit Query

- [Products](#)
- [Applications](#)
- [Contact Us](#)
- [Industry News](#)
- [Company](#)
- [Try a Free Sample](#) [Request a Quote](#) [Request Information](#)
-

Applications »

- [Industrial and Process Chemicals](#)
- [Outsourcing](#)
- [Potable Water Treatment](#)
- [Cold Lime Softening](#)
- [Wastewater Treatment](#)
- [Phosphorous Removal](#)
- [Algae Control](#)
- [Refractory Cement Additives](#)
- [Drilling Mud Additives](#)
- [Lost Circulation](#)
- [Concrete Additives](#)

Algae Control

USALCO delivers [Aluminum Sulfate](#) and [Sodium Aluminate](#) to companies who provide algae control solutions for large bodies of water. We supply the product in bulk quantities in dedicated transportation equipment to insure quality. USALCO has multiple plants and can manage the chemical logistics of sizable projects required for lake algae removal.

Large inputs of nutrients to lakes and reservoirs are well known to cause a variety of water quality problems such as nuisance algal blooms, noxious odors, low water clarity, low oxygen concentration, and fish kills. Persistent water quality problems can impair potable water supplies, reduce recreational opportunities and lower property values.

Excess nutrients, like nitrogen and phosphorus, feed the algae. Phosphorous reduction is key to algae control in lakes. Phosphorous comes from many sources, including agricultural fertilizers, manure, residential lawn fertilizers, septic and sewage systems, storm water, municipal [wastewater treatment](#) plants, wildlife—and the often over looked phosphorus rich lake bottom itself!

Cyanobacteria (also known as blue green algae) are a specific type of algae capable of producing toxins and frequently occur in high nutrient lakes. The increased presence of freshwater toxic algae in our lakes is an alarming and relatively recent trend which is linked to increases in nutrient inputs. Ingestion and/or contact with algal toxins can cause skin irritations, allergic reactions, gastrointestinal symptoms, respiratory problems and in some cases death in pets, livestock, and humans. Recent

research has also linked algal toxins to higher occurrences of Alzheimer's and Lou Gehring's disease in human populations.

Toxic algae and nuisance algal blooms (and associated poor water quality symptoms) can be reduced or eliminated by lowering the amount of phosphorous in the lake.

USALCO provides aluminum based products, like [Aluminum Sulfate](#) and [Sodium Aluminate](#). When used properly, these products can reduce the amount of the phosphorous in stormwater, streams, and [wastewater treatment](#) plant runoff. These products are highly effective in reducing phosphorous inputs from the lake bottom and lowering the amount of phosphorous in the lake to support the algae. The use of both products when applied and metered correctly insures adequate sequestering of the phosphorous and prevents ph disruptions that can lead to fish kills.

USALCO is unique in being able to provide both products for algae control. USALCO can also guide you to applicators who can help solve your algae removal problem.

Please contact us for more information.

See also: [Phosphorous Removal](#)

- [Products](#)
- [Applications](#)
- [Contact Us](#)
- [Industry News](#)
- [Company](#)
- [Sitemap](#)

Copyright © 1998-2011 USALCO. All rights reserved.



(410) 918-2230

info@usalco.com

USALCO

Get in Touch: (410) 918-2230

Search

- [Products](#)
- [Applications](#)
- [Contact Us](#)
- [Industry News](#)
- [Company](#)
- [Try a Free Sample](#) [Request a Quote](#) [Request Information](#)
-

Products »

- [Aluminum Sulfate \(Alum\)](#)
- [Alumer – Alum Polymer Blend](#)
- [Acid Alum](#)
- [Sodium Aluminate – Liquid](#)
- [Sodium Aluminate Dry](#)
- [Potassium Aluminate](#)
- [Custom Services](#)

Aluminum Sulfate (Alum)

[Aluminum Sulfate MSDS](#)[Aluminum Sulfate PRODUCT BULLETIN](#)[Handling and Safety](#)[WATER TREATMENT PLANT DIAGRAM](#)

USALCO provides Aluminum Sulfate (Alum) in bulk truckload quantities for municipalities and industrial users. We use dedicated trucks to insure quality and have multiple plants to meet your needs.

USALCO Aluminum Sulfate (Alum), is a high quality, iron-free, clear solution that meets the specifications of the American Water Works Association Standard B403-09 and complies with the requirements of NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects at a maximum dosage of 150 mg/L.

Iron free Aluminum Sulfate (Alum) is most widely used in municipal drinking water and waste water treatment systems. In potable water applications, alum functions as an excellent primary coagulant. Through charge neutralization and flocculation in raw water, alum removes:

- Turbidity
- Suspended solids
- Total organic carbon (TOC)
- Biochemical oxygen demand (BOD)

Aluminum Sulfate easily hydrolyzes to form insoluble precipitates which aid in removal of tiny particles that cannot be easily filtered and/or are too small to settle via gravity in a useful period of time.

USALCO liquid Aluminum Sulfate is ready to use and mixes well in water, unlike granulated alum which must be dissolved in order to work. It does not add color to the water treatment process.

Aluminum sulfate is one of the most versatile chemicals used in both the municipal and industrial markets. End uses for aluminum sulfate include:

- Potable Water Treatment
- Wastewater treatment: Clarification and phosphorus removal.
- Lakes and ponds: Removal of excess nutrients, such as phosphates that contribute to algae growth. Ultimately, this provides algae control.
- Paper mills: Charge neutralization, rosin sizing, and pitch control.
- Dye: Fixing dyes to fabrics and textiles, without altering the color of the dye.
- Synthetic catalyst production.

The USALCO manufacturing process utilizes only the finest available raw materials. USALCO Aluminum Sulfate is manufactured by dissolving alumina tri-hydrate (ATH) into sulfuric acid and water to produce a superior quality aluminum sulfate.

Typical Properties

Property	UM	Alum
Al ₂ O ₃	Wt.%	8.28
Fe ₂ O ₃	ppm	50 max
Specific Gravity@ 60°F	-	1.33
Baume @ 60°F	-	35.77
Density	-	11.08
Color	Lbs/Gal	Clear to Amber or Light Green
Dry 17% Alum	Wt.%	48.20

If you would like more information, please Contact Us.

- Products
- Applications
- Contact Us
- Industry News
- Company
- Sitemap

Copyright © 1998-2011 USALCO. All rights reserved.



(410) 918-2230

info@usalco.com

UPDATE: USE OF BLUESTONE (COPPER SULFATE) FOR ALGAE CONTROL

(view also as [PDF](#))

William A. Wurts, Senior State Specialist for Aquaculture,
Kentucky State University Cooperative Extension Program
<http://www.ca.uky.edu/wkrec/Wurtspage.htm>

Often, the existing literature on the use of copper sulfate does not consider water alkalinity and the presence of fish in the pond or lake to be treated. Fish populations in waters with total alkalinity values below 50 ppm (= mg/l, milligrams/liter) are sensitive to copper and may die if copper sulfate is used to treat algae. Alkalinity values below 50 mg/l are common throughout the state, particularly in west Kentucky.

Previously, the recommended rate of application was 2-6 lbs of copper sulfate per acre foot of water with alkalinity values from 150 to 200 mg/l. Most water sources in Kentucky have alkalinity values well below that. As long as loss of fish is not a concern and label recommendations are carefully followed, the previously recommended rates for algae control are acceptable in low alkalinity waters.

If preserving fish populations and accuracy are important, water alkalinity must be checked and the following application rates should be used:

Total Alkalinity (mg/L)	Copper Sulfate Applied (lb/acre-foot)
Below 20	Copper sulfate should not be used
20	0.6
50	1.3
100	2.0
150	2.8
200	5.5
Above 200	Effectiveness of copper sulfate is greatly reduced
*Swimming pool supply companies usually carry an affordable kit that will test total alkalinity. Carp, grass carp, goldfish, koi, trout and salmon are reported to be more sensitive to copper than other fish. Therefore, it may not be advisable to use copper sulfate in ponds stocked with these fish.	

There are no restrictions regarding use of water treated with copper sulfate for irrigation, livestock or domestic purposes if copper sulfate was applied in accordance with the manufacturer's recommendations (read label carefully).

When applying copper sulfate, it should be distributed as evenly as possible over the pond surface. This may be accomplished by spraying, placing the chemical in a finely woven sack and dragging it by rope,

or dissolving the material in water and dispersing it slowly from behind a boat; criss-crossing the entire pond.

Copper sulfate is applied as a full pond treatment. In other words, a toxic concentration must be achieved for the entire pond volume. If a dense bloom of algae has covered most of the pond, copper treatment is not advisable. The treatment will likely cause a sudden, algal die off. An oxygen depletion could result as dead algae decay and the fish will suffocate. To avoid oxygen depletions, ponds with greater than 30% algae coverage should not be treated with an algicide. A hand sprayer can be used for spot treatments to help control the growth of small, dense (thick) patches of algae in ponds with chronic algae problems or with 30-100% coverage. When using a hand sprayer for spot applications, a concentrated or supersaturated solution will help reduce the risk of an oxygen depletion when a full pond treatment is not possible; and minimizes the amount of copper added to the pond. A concentrated solution is mixed by filling a 2- to 5-gallon bucket with water and adding copper sulfate -- stirring constantly -- until no more will dissolve. The solution should be sprayed directly onto the patch of algae. Spot treatments can help limit algae problems, particularly in low alkalinity waters, as long as the area treated and the total amount of copper sulfate applied (less than 1/2 lb per acre foot) is small. Copper sulfate is corrosive to metal containers.

One species of algae, Pithophora, may be difficult to control. Simazine or Endothall may also be used for algal control. However, there are some aquatic use restrictions for these compounds (check label).

An acre foot is one surface acre of water with a depth of one foot. The number of acre feet is calculated by determining the number of surface acres of water and multiplying by the average depth of the entire pond. Average depth is determined by measuring pond depth at several different locations with a string attached to a weight. Add all measurements and divide by the number of readings collected. Accuracy will be increased by taking measurements from as many different locations as practical. Accurate volume determination is important since treatment doses are often slightly less than lethal doses where fish are involved.

Household Weight Conversions		
	Weight of Copper Sulfate (grams)	
Household Measure (level)	Snow (rice or sugar shaped grains)	Powder
1/4 tsp	1.6	1
1/2 tsp	3.2	2
1 tsp	6.4	4
1 Tbsp	19	12
1/4 cup	77	48
1/2 cup	154	96
1 cup	307	192
1.0 pound = 453.6 grams Weight in pounds = weight in grams divided by 453.6 1/4 cup copper sulfate snow weighs 77 grams Weight in pounds = 77 / 453.6 = 0.17 lb		

For related information click on the topics below:

MANAGING RECREATIONAL FISH PONDS

(view also as [PDF](#)) World Aquaculture, 23(2): 41-47.

LIMING PONDS FOR AQUACULTURE.

Southern Regional Aquaculture Center, Publication No. 4100.

(pdf) INTERACTIONS OF PH, CARBON DIOXIDE, ALKALINITY AND HARDNESS IN FISH PONDS.

Southern Regional Aquaculture Center, Publication No. 464.

(pdf) EFFECTS OF BICARBONATE ALKALINITY AND CALCIUM ON THE ACUTE TOXICITY OF COPPER TO JUVENILE CHANNEL CATFISH (ICTALURUS PUNCTATUS).

1994. Aquaculture, 125: 73-79.

(pdf) EFFECTS OF CALCIUM AND MAGNESIUM HARDNESS ON ACUTE COPPER TOXICITY TO JUVENILE CHANNEL CATFISH ICTALURUS PUNCTATUS.

1999. Aquaculture, 172: 275-280.

[\(back to On-Line Literature page\)](#)

COPPER SULFATE SALE!

MULTI-USE Copper Sulfate Crystals

* WHOLESALE PRICING FOR EVERY ORDER!

Home
Algae Control
Kill Roots
Bordeaux Mix
Copper Deficiency
Foot Bath
Also Used For
Metal Etching
Calcium Hydroxide
FAQ
About Us
Contact Us
Buy Now!

COPPER SULFATE ALGAE CONTROL - PONDS & LAKES

Farm Ponds - Landscape Ponds - Freshwater Aquaculture - Wholesale



Copper Sulfate POND ALGAE CONTROL Farm Pond Algae Control - Lake Algae Control FRESHWATER AQUACULTURE ALGAE CONTROL

Buy Copper Sulfate Crystals online at **WHOLESALE PRICES!**
It is better to Prevent pond algae control problems than to Wait.

Our Copper Sulfate Crystals are the purest you can buy.

Buy Copper Sulfate Pond Algae Control Now!

Copper Sulfate Pond Algae Control is the most widely used and economical algae control available. Copper Sulfate pond algae control and lake algae control is particularly **outstanding** for controlling weeds in the mid-growth stage (filaments of approximately 1 cm long), when algae most resemble grass clippings.

Copper Sulfate Pond Algae Control effectively controls many species of both filamentous (mat forming green) and planktonic (single cell blue-green) algae. Dosages of copper sulfate and how it works are affected by algae species, water hardness, water temperature, concentration, and if water is clear, turbid, flowing, or static. Preferably water should be clear and above 60°F with treatment in late morning on a sunny day. Our Crystals will naturally sink to affect the algae at its base. Copper Sulfate can also be dissolved and applied to the water surface as a spray, or put in a fine mesh bag and dragged through the water until it is fully dissolved.

Static water usually requires less Copper Sulfate than flowing water. The harder the water or the greater the algae concentration, the higher the required dose of Copper Sulfate. If floating mats of green algae are present, it is advisable to especially treat the surface of these mats for best control. Algae will absorb the Copper Sulfate within hours after treatment, and death should be evident within 3

to 5 days. If there is some doubt about the concentration to apply, it is generally preferable to begin with a lower dose and increase the dose until the algae are killed. (A few algae species are resistant to Copper Sulfate and may not be killed.) Repeat treatments within a season may be needed to keep algae under control to the desired level.

When to Apply: Early treatment is essential for most satisfactory algae control at the lowest dosage levels. Early growth is usually confined to shallower shore areas. Begin treatment when not over 5 to 10 percent of the water surface area is covered with algae growths which is usually nearest the shoreline. Delaying treatment until heavy algae growths are present usually requires a higher dose and may result in fish distress or death since rapid decomposition of heavy growths greatly reduces the oxygen content of the water. Several repeat treatments are usually necessary to control algae each season.

Spot treatments of one quarter of the pond over three to four day intervals may lower algae densities without consuming all the dissolved oxygen. Treatments can be combined with spray or bubble aeration to alleviate low oxygen problems. The recommendation is to treat less than one half of a water body at a time to help reduce the potential for fish kills. Treat the remainder of the pond at three to four-day intervals.

APPLICATION RATES:

COPPER SULFATE ALGAE CONTROL

Algae Control for Ponds & Lakes

Apply Copper Sulfate Crystals at a rate of about 0.6lb-5.5lb per acre-foot of water, most commonly a 2.75lb rate is used. An acre-foot is 43,560 square feet in area x 1 foot deep. The number of acre feet is calculated by determining the number of surface acres of water and multiplying by the average depth of the entire pond. Average depth is determined by measuring pond depth at several different locations with a string attached to a weight. Add all measurements and divide by the number of readings collected. Accuracy will be increased by taking measurements from as many different locations as practical.

Total Alkalinity	Copper Sulfate Applied
(mg/L)	(lb/acre-foot)
Below 20	Copper sulfate should not be used
20	0.6
50	1.3
100	2.0
150	2.8
200	5.5
Above 200	Effectiveness of copper sulfate is greatly reduced

*Swimming pool supply companies usually carry an affordable kit that will test total alkalinity.

Put the crystals in a porous bag and drag it through the water until the crystals dissolve. Use an empty milk jug as a float to keep the bag near the surface. Copper Sulfate can also be applied by just broadcasting over the water and letting it sink. Apply in early spring prior to formation of matted growth. Chemical treatment works best when the water temperature is between 60°F and 80°F and algae clumps are broken up during chemical application. Avoid treating when the water temperature is above 80°F and treat only 1/4 to 1/3 of the vegetation at a time to prevent

oxygen depletion and a possible fish kill.

PLEASE Use Our CONTACT FORM for questions.



EPA NOTICE:

EPA Reg. No. 46923-4 EPA Est. No. 46923-NJ-1

IMPORTANT EPA INFORMATION:

The 50 pound Copper Sulfate CRYSTALS-EPA Label that we sell has an EPA approved number on the bag. There are full instructions on the bag to do all that our site talks about.

The 50 Pound bag of Copper Sulfate Fine-Feed Grade and the 10 Pound bags of Copper Sulfate Fine-Feed Grade and Crystals Ag Grade do NOT have the EPA label on them and therefore have NO CLAIMS for Algae Control, Killing Roots, Fungicide, or Bordeaux Mix. If you are purchasing a 10 or 50 Pound bag of Copper Sulfate Feed Grade or Ag Grade, it is just simple labeled "Copper Sulfate---Feed Grade" or "Copper Sulfate---Ag Grade" and is to be used for the dozens of other non-EPA uses for Copper Sulfate listed under our "Other Uses" page.

When placing an order, the purchaser acknowledges they have taken full responsibility to check and follow local, state and federal regulations regarding application of copper sulfate. Also, the purchaser assumes responsibility to follow proper handling and safety requirements for the product. The seller is not to be held accountable for any incidents of bodily or environmental harm due to improper handling.