

# AGMIN NEWSLETTER No. 230

## A Risk Management Approach to Controlling Algal Blooms

Algal Blooms, especially with blue-green algae, can develop very rapidly under favourable conditions of sunlight, temperature, nutrient load and low water flow. Typical growth rates produce a doubling of cell numbers in 3 days and a ten-fold increase in 10 days. Most blue-green algae produce toxins (liver and neuro-toxins), which are in direct proportion to their cell numbers.

During the late stages of such a bloom, 10 – 20% of the cells die or become damaged, thereby releasing their toxins into the surrounding water body. Under these conditions, it is sound water management practice to control an emerging algal bloom at least at the Alert Level 2 (15,000 cells/mL), to prevent increasing amounts of toxin from being produced and released into the stored water. An Alert Level 2 bloom will increase to 140,000 cells/mL in 10 days, producing a cell density exceeding Alert Level 3 (the highest category). Refer to Newsletter No. 225 for further details.

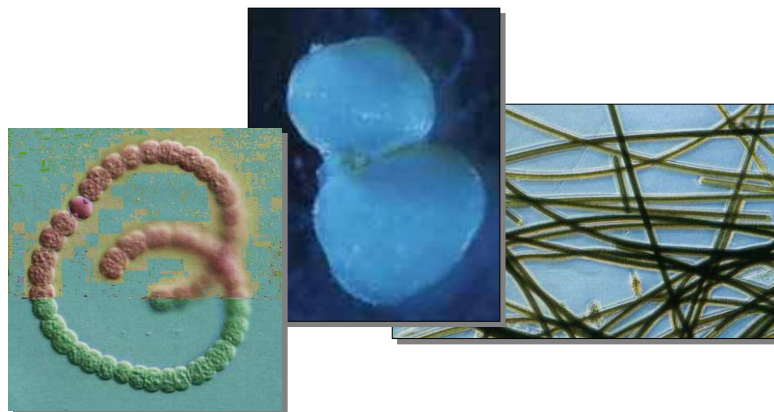
To control this risk and to prevent a hazardous situation of contaminated drinking water occurring, it is recommended to apply Cupricide® Algicide at Alert Level 2 or earlier. A standard Risk Assessment Procedure should be applied to this hazardous situation. A quantitative Risk Score is calculated from the product of Likelihood (of the hazardous event occurring) and consequence (of the hazardous event).

**Likelihood (L) is defined by the following values:**

Almost Certain	10
Likely	8
Possible	6
Unlikely	4
Rare	2

**Consequence (C) is defined by the following values:**

Catastrophic	25	(e.g., > \$500,000 damages)
Major	8	(e.g., \$100,000 - \$500,000 damages)
Moderate	6	(e.g., \$20,000 - \$100,000 damages)
Minor	4	(e.g., \$5,000 - \$20,000 damages)
Insignificant	2	(e.g., \$1,000 - \$5,000 damages)



A standardised Risk Score (R) can now be calculated from the product of Likelihood x Consequence.

The level of Risk can be identified by using the definitions below:

Risk Score	Level of Risk	Actions Required.
4-15	Low Risk	Alert Level 1; monitor growth of algal bloom.
16-31	Moderate Risk	Alert Level 2; prepare for algal control by use of Cupricide®.
32-63	High Risk	Alert Level 3; immediate control of algae by use of Cupricide®.
64 and above	Extreme Risk	Discontinue supply; control algae by using Cupricide® re-assess risk after 3 days.

For example, a hazardous event which is “unlikely” (L=4) with a consequence of “minor” (C=4) will produce a Risk Score (R) of 16 (moderate risk). However, when the event becomes “possible” (L=6) and the consequence is “major” (C=8), then the Risk Score is 48 (high risk). Appropriate safety measures should be implemented in response to the risk factors identified by the above process, to reduce the risk as low as reasonably practicable.

It is important to assess the risks of a harmful algal bloom that is not controlled and then to compare the risks after treating the algae with an Algicide such as Cupricide®. The risks of treating an algal bloom with Cupricide® in the early stages of development (< 15,000 cells/mL) will be less than the risks posed by a full-blown algal bloom (> 100,000 cells/mL), with the accompanying release of toxins at higher concentrations, when the bloom finally collapses through natural causes.

#### Risk Scores calculated from the product of Likelihood x Consequence

	Consequence				
Likelihood	25	8	6	4	2
10	250	80	60	40	20
8	200	64	48	32	16
6	150	48	36	24	12
4	100	32	24	16	8
2	50	16	12	8	4

#### Legend:

Extreme Risk	> 64
High Risk	32 – 63
Moderate Risk	16 – 31
Low Risk	4 - 15



**AGMIN CHELATES PTY LTD**

(A.C.N. 006 413 458) (A.B.N. 30 006 413 458)

32 Wattlepark Avenue, MOOLAP, VIC. 3224

Phone: (03) 5248 3828 Fax: (03) 5248 1603

Email: [service@agmin.com.au](mailto:service@agmin.com.au) Website: [www.agmin.com.au](http://www.agmin.com.au)

